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Flow and the perceived balance between challenges and skills in physical education and other classes in a secondary school curriculum

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Flow and the Perceived Balance Between Challenges and Skills in Physical Education and Other Classes in a Secondary School Curriculum

by

Gary Leonard Chandler

A Dissertation Submitted to
the Faculty of the Graduate School at
The University of North Carolina at Greensboro
In Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

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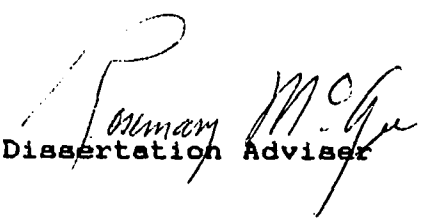

Dissertation Adviser

APPROVAL PAGE

This dissertation has been approved by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro.

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June 24, 1987
Date of Acceptance by Committee

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A 21-item response sheet was employed to collect data on the occurence of flow, as well as the thoughts, actions, and certain feelings of students. Three hundred and ten secondary school students were alerted once in each class on two non-consecutive days. The three class types investigated included physical education, high flow type (art, music, shop, etc.), and low flow type, traditionally academic classes (mathmatics, English, science, etc.). Data were collected the week of April 7-11, 1986.

Data were treated descriptively to examine means and standard deviations among three class types on the components and dimensions.

Physical education classes had the highest means on all dimensions except one. Physical education classes had the higheat subtotal means on the components cognitive efficiency, motivation, activation and affect.

Students in all three classes tended to be thinking about and doing classwork. To a lesser extent students were thinking about and doing social/personal things.

Data were treated descriptively to examine the occurrence of flow (Challenge=Skills) in the three class types. The incidence of flow was determined by the student response frequency on the dimensions challenge and skill. Physical education classes had the higheat percentage (32%) of flow while low flow type classes had the lowest

percentage (25%) of flow. The high incidence of no flow in each class may have been influenced by the exacting limitations of the requirements for flow.

ACKNOWLEDGEMENTS

I would like to acknowledge those who share in this accomplishment. Special thanks go to each of my committee members for their continued willingness to serve, advise, and support. Special appreciation and my deepest respect go to Dr. Rosemary McGee for her patience, understanding, and willingness to act when my progress required it. Thanks to Dr. Janet Harris for introducing me to the concept of "flow." Appreciation is extended to Dr. Gail Hennis and Dr. William Purkey for their contributions as members of my committee. Appreciation is also extended to Dr. Joe Mick, Dr. Stanley Williams, Dr. Tom Adams and Mrs. Glenda H. Anderson for their statistical contributions. Thanks to my colleague Dr. Tom Adams for his continual willingness to listen, share, and confer.

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In many, many ways my parents, Joe and Jean Chandler

influenced me toward this end. I thank them both for this. Thanks to my brother Mark who provided the challenges for the "flow" early on in my life.

To my sister, Dr. Josephine Holcomb I offer my love and thanks for her lifelong support, advice, and faith. She has my gratitude for her expemplary role in my life. She's the best teacher a person could have--a wonderful model.

DEDICATION

This research is dedicated to my wife and best friend, Linda Thompson Chandler. She has been with me every step of the way and she never once asked me when I was going to be finished. She supported me morally and financially, loved me, and has stood by me until things got better. She has exhibited a quiet faith that helped bring this labor of love to fruition. She has the patience of Job--and all my love, gratitude, and respect.

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CHAPTER I

INTRODUCTION

Overview

This study is concerned with understanding how adolescents perceive themselves in physical education and other curriculum classes in a secondary school. Do adolescents enjoy certain classes or do they tolerate them? Are they challenged by them or bored? These and other elements have been explored by numerous investigators to learn more about adolescents in school as well as in other areas of society (Coleman, 1961; Douvan and Adelson, 1966; Kiell, 1969; Moos, 1972; Csikszentmihalyi, 1975; Mayers, 1978; Rutter, Maughan, Mortimore, and Ouston, 1979; Kitwood, 1980; Offer, Ostrov, and Howard, 1981; Coleman, Hoffer, and Kilgore, 1982; Chalip, Csikszentmihalyi, Kleiber, and Larson, 1984; Csikszentmihalyi and Larson, 1984).

If a student enjoys a class, it is logical that the student is likely to return to that class in a more receptive frame of mind. Is it not possible, then, to eliminate some of the negative school-related ideas often associated with learning such as "forcing students to learn," "punishment with spelling drills,"

for not completing an assignment, or "writing the multiplication tables" for failing a math test? Csikszentmihalyi and Larson (1984) found that, for some students, some classes are intrinsically motivating. They suggest that "even productive activities [such as learning] can be enjoyable" (p. 253).

Teachers of a particular subject matter are at least partially responsible for the attitudes of students toward that subject matter. Attitudes toward learning, about themselves, and about people in general are reflected daily by teachers in the classroom. If teachers incorporate positive attitudes it may be possible for adolescents to more consistently and enjoyably continue to learn all their lives. This potentiality holds positive implications not only for the future of adolescents but for society as well. Classrooms which are perceived in a positive manner by adolescent students may not only enhance their "developing competence" (Mayers, 1978, p. 1) but may also provide intrinsically rewarding experiences.

The particular research reported here will examine the relation between secondary school students' reports of certain affective measures in physical education classes and other academic classes. There is a dearth of data indicating "when, how, and under what conditions students

experience school as either enjoyable or frustrating" (Mayers, 1978, p. 2). The development and application of the Experiential Sampling Method (ESM) (Larson and Csikszentmihalyi, 1983; Csikszentmihalyi and Larson, 1984) has improved researchers' understanding of adolescent actions and feelings in everyday situations and in classroom environments. This awareness and understanding is important, because if adolescents can be understood better in particular environments, perhaps they can be better comprehended as a whole. Mayers (1978) determined that certain cognitive, affective, and behavioral outcomes of adolescents may be predicted if we understand these components, as represented in the ESM.

Mayers reported (1978) that in a classroom in which challenges are perceived by the student as meeting the individual's perceived capabilities, the student "experiences positive affect" (p. 5). A carryover effect emerges as the "positive affect is internally rewarding and motivates the student to participate in the class and learn its contents" (p. 5). Important to the continuity of this aspect of learning is reinforcement. It is important that students become aware of and are encouraged to see the opportunities for success which lie immediately ahead as well as to perceive the surmountable challenges which may confront them later (Mayers, 1978).

A portion of the effectiveness of students which follows this student awareness is based upon teacher willingness to apply available feedback to amend correctable student mistakes. Should students not be drawn to learning, nor enjoy the opportunities and challenges placed before them, teachers may be perceived to be at fault.

Csikszentmihalyi and Larson (1984), Mayers (1978), and Moos (1979) have indicated the role and importance of enjoyment and challenges in the personal lives of adolescents and in their school lives. To strengthen this potential and add yet another "means by which schools could increase harmony, good behavior, and academic success" (Rutter et al. 1979, p. 199), this investigator suggests that educators should predispose themselves to learn more about adolescents' enjoyment, challenges, and interests.

Determination of Flow

> The experience of flow--i.e. when challenges equal skills--is hypothesized to contribute significantly to subjective well-being (C=S). When challenges are perceived as being greater than skills, that is, when the individual does not perceive himself or herself as having the skills or capabilities to deal with the demands of a situation, then negative life assessments will result, specifically tension or anxiety (C>S). When skills are perceived as outweighing challenges, then negative assessments will result, specifically lower moods, boredom (C<S). When no challenges are perceived and one does not perceive himself or herself to be using any skills, then negative assessments will result, specifically passivity, inactivity, and lethargy

> (CS=0). Thus the ideal subjective precondition for a positive sense of well-being is when an individual's life is most aptly characterized by his or her own perception of being offered opportunities in life situations that he or she is capable of meeting. (Gianinno, et al., 1979, p. 7).

Csikszentmihalyi (1975) indicated that "[i]deally, anyone could learn to carry inside himself the tools of enjoyment" (p. 53). A flow episode may start "just by directing [one's] awareness to conform with the requirements of flow, like limiting the stimulus field so as to allow the merging of action and awareness" (p. 49). While it is proposed that "one can enter flow while engaged in any activity, some situations (such as games, art, etc.) appear to be designed almost exclusively to provide the experience of flow" (p. 49).

Though not all flow activities are similar, "flow activities seem to share certain characteristics" (Csikszentmihalyi , 1975, p. 49). "[A]ctivities that reliably produce flow experiences are similar in that they provide opportunities for action which a person can act upon without being bored or worried" (p. 49). "Flow is experienced when people perceive opportunities for action as being evenly matched by their capabilities" (p. 50).

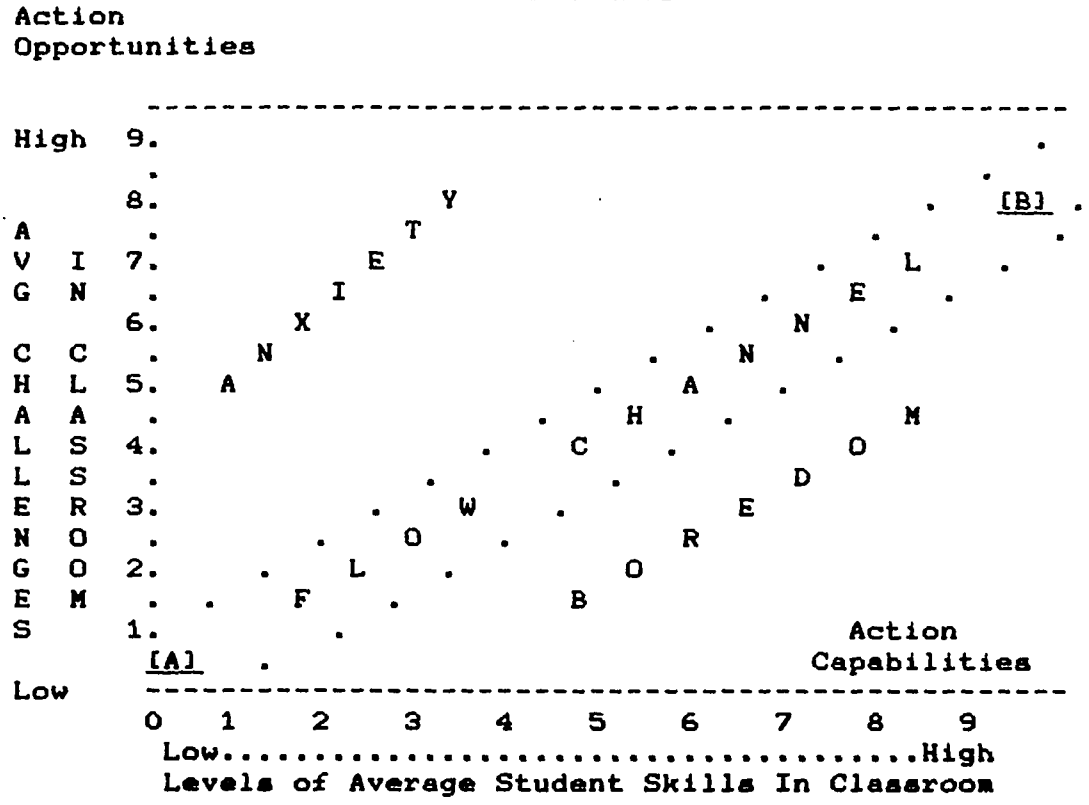
Whenever "skills are greater than the opportunities for using them, boredom will follow" (p. 50). It follows, then, that "a person with great skills and few

opportunities for applying them will pass from the state of boredom again into the state of anxiety" (p. 50). Csikszentmihalyi (1975) described a flow activity as one which "provides optimal challenges in relation to the actor's skills" (p. 50). This concept is illustrated in Figure 1 as suggested by Csikszentmihayli (1975).

"[A] state of flow does not depend entirely on the objective nature of the challenges present or on the objective level of skills; in fact, whether one is in flow or not depends entirely on one's perception of what the challenges and skills are" (Csikszentmihalyi, 1975, p. 50). Flow may be experienced in activities of varying complexity. For example, a child (see Figure 1, point [A]) playing with a toy may be experiencing the challenge of coordinating actions with the appropriate skill level. At the same time, an adult violin player (see Figure 1, point [B]) may be mastering a complex solo for the first time. Both may be experiencing flow, both may be experiencing flow, both may be experiencing extreme fulfillment and enjoyment, but at different levels of performance complexity (Csikszentmihalyi and Larson, 1984, p. 267). The child or adult in the above example experienced no difference in feeling. The difference in the activities is in "its consequences" (p. 267).

Figure 1

The Flow Model



Note. From Being Adolescent (p. 265) by M. Csikszentmihalyi and R. Larson, 1984, New York, Basic Books. Adapted by permission.

The child no longer experiences flow when experience is explored and loses its challenge. Even the violinist will likely reach a level wherein the individual will be ready to accept a new challenge.

> To keep experiencing flow, one must try new things, and do them better everytime. Boredom and anxiety represent the negative feedback that makes performers realize that they no longer enjoy what they are doing. To recapture that enjoyment, we must formulate increasingly complex goals, face new challenges, and learn new skills (Csikszentmihalyi and Larson, 1984, p. 268).

Csikszentmihalyi and Larson (1984) posited that "[p]erhaps the main reason adolescents stop growing is because their initial lack of skills is exposed too suddenly to excessive challenges" (p. 269).

The opportunities for growth lie in one's ability to identify and recognize challenges within one's environment. Csikszentmihalyi and Larson (1984) reflected that

> most people's environment is a potential playground full of exciting things to do. The catch is that, to the naked eye, the opportunities are invisible. A person must be already initiated to enter one of the...games. The price of admission is learning to recognize the challenge, [and] making the effort to see what can be done (p. 269).

The greater the challenge, the greater the effort and focusing of attention required to master the complexities, but also, the greater the rewards. "[O]nly by paying the price does one grow, and taste enjoyment"

(p. 269).

Statement of the Problem

For reasons outlined by Csikszentmihalyi (1975) and Csikszentmihalyi and Larson (1984), adolescent students appear to enjoy certain activities in school more than others. Classes which seem more likely to produce flow experience usually provide students "with some form of physical and sensory participatory activity" (Csikszentmihalyi and Larson, 1984, p. 206), such as art, music, home economics, industrial arts, and physical education. On the other hand, Csikszentmihalyi and Larson (1984) have identified classes providing few flow experiences as classes which "deal with highly structured symbolic systems" (p. 206) such as mathmatics, foreign languages, and English. On the basis of these previous findings, the following questions are formulated:

> Question 1: Are the any differences among physical education, high flow and low flow type curriculum classes on the dimensions comprising the components of cognitive efficiency, motivation, activation and affect, as well as challenges and skills.
>
> Question 2: Are there any differences among physical education, high flow, and low flow type curriculum classes on the dimensions of thoughts and actions.
>
> Question 3: Are there any differences among the types of classes on frequency of flow (C=S).

Limitations of the Study

This study investigates the feelings and responses of students at one secondary school in a small midsouthern town. The reader, therefore, should consider the results of this investigation in light of this limitation.

Assumptions Underlying the Study

The Experiential Sampling Method, including the Response Sheet, is a valid means of measuring specific constructs (Csikszentmihalyi, et al., 1979; Chalip, et al., 1984; Csikszentmihalyi and Larson, 1984; Larson and Csikszentmihalyi, 1983).

Students serving as subjects responded candidly and accurately to questions and statements posed on the Response Sheet.

Scope of the Study

1. This study utilized the entire population of 310 secondary school students representing various grade levels and various curriculum classes at Rivercrest High School in Wilson, Arkansas.

2. Information was obtained via one method, the Experiential Sampling Method (ESM) Response Sheet.

3. Based upon data collected from the ESM Response Sheets, elements relevant to subject perceptions in the classroom were identified and compared. This study was

designed to identify and compare student classroom responses in physical education classes, high flow type classes, and low flow type classes relative to the six components of cognitive efficiency, motivation, activation, affect, as well as challenges and skills.

4. Data were collected during the week of April 7-11, 1986.

Definition of Terms

The following terms are defined as they were used in this study:

Activation--The dimension on the ESM Response Sheet comprised of the components alert-drowsy, active-passive, strong-weak, excited-bored (Csikszentmihalyi and Larson, 1984).

Adolescent--Any student in the 10th, 11th, or 12th grade.

Affect--The dimension on the ESM Response Sheet comprised of the components happy-sad, cheerful-irritable, sociable-lonely, friendly-angry (Csikszentmihalyi and Larson, 1984).

Anxiety--The feeling which results from an imbalance between challenges and skills such that perceived challenges are greater than one's sense of skill. "When an activity presents too many opportunities for action, or challenges, and these overwhelm our

skills, we feel anxious" (Csikszentmihalyi and Larson, 1984, p. 251-252).

Boredom--The feeling which results from an imbalance between challenges and skills such that one's sense of skills are perceived as greater than one's perceived challenges. "When skills outweigh the challenges available, we feel bored" (Csikszentmihalyi and Larson, 1984, p. 252).

Cognitive Efficiency--The dimension on the ESM Response Sheet comprised of the components concentration, ease of concentration, unself-consciousness, and confused-clear (Csikszentmihalyi and Larson, 1984).

Enjoyment--The feeling arising from participation in those activities which "shape the growth of the self by focusing attention on goals that require increased skills for their achievement" (Csikszentmihalyi and Larson, 1984, p. 26). This sense of fulfillment which one feels arises when one has satisfied the need to grow, take on, and develop new skills, and to take on new challenges in maintaining a self-concept as a fully functioning human being (Csikszentmihalyi, 1975). Enjoyment tends to occur whenever a person feels that his or her capacity to act matches the opportunities for action in a given situation (Csikszentmihalyi and Larson, 1984). More practically, enjoyment may be construed to be the feeling

which individuals have when they want to be where they are, doing what they are doing "rather than wishing they were someplace else, doing something else" (Mayers, 1978, p. 7).

Experiential Sampling Method (ESM)--An objective means by which researchers may determine daily experiential information about one's time usage, thoughts, reflections, emotional patterns, and cognitive states. The ESM is a tool for comprehending not only an individual's life, but the individual as well (Larson and Csikszentmihalyi, 1983). The ESM involves the daily random alert of subjects and subsequent completion of a response sheet by subjects.

Flow--"When an activity presents too many opportunities for action, or challenges and these overwhelm our skills, we feel anxious. When skills outweigh the challenges available we feel bored. Flow occurs when we come close to matching the two" (Csikszentmihalyi and Larson, 1984, pp. 251-252). "[F]low is experienced when personal skills match situational challenges" (p. 265). "The experience of flow--i.e. when challenges equal skills--is hypothesized to contribute significantly to subjective well-being, (Challenges=Skills). When challenges are perceived as being greater than skills, that is, when the individual

does not perceive himself or herself as having the skills or capabilities to deal with a situation, negative life assessments will result, specifically tension or anxiety, (C > S). When skills are perceived as outweighing challenges, negative assessments will result, specifically lower moods, boredom, (C < S). When no challenges are perceived and one does not perceive himself or herself to be using any skills, negative assessment will result, specifically passivity, inactivity, lethargy, (CS=0). Thus the ideal subjective precondition for a positive sense of well-being is when an individual's life is most aptly characterized by his or her perception of being offered opportunities in life situations that he or she feels capable of meeting" (Gianinno et al. 1979, p. 7). When this condition exists, one experiences flow.

Flow Activities--"Those activities which provide the...flow experience" (Csikszentmihalyi, 1975, p. 36.) Flow Model--A model "which defines enjoyment as a balance between the challenges of an activity and the skills of the participant. Anxiety is defined as an imbalance between challenges and skills such that perceived challenges are greater than one's sense of skills. Boredom sets in when one's skills are greater than the challenges of an activity. When challenges and

skills are equal and greater than zero, experience is optimal and is called flow" (Chalip et al. 1984, p. 109). See flow model in Figure 1.

High Flow Type Class--"[C]lasses that provide more concrete goals and require more than intellectual skills, such as [art,] industrial arts..., and music" (Csikszentmihalyi and Larson, 1984, p. 206). "These classes provide students with some form of physical and sensory participatory activity" (p. 206).

Intrinsic Motivation--A person's identification with the "goals of the activity" (Csikszentmihalyi and Larson, 1984, p. 24). "[G]enerally positive feelings and activation accompany intrinsic motivation" (p. 24).

Intrinsic Rewards--The results of activities which people "are motivated to pursue because they derive some satisfaction from them, and this satisfaction itself acts as a reward" (Csikszentmihalyi, 1975, p. 13).

Low Flow Type Class--"Classic academic subjects such as math, foreign language, and English;" "classes [which]...deal with highly structured abstract symbolic systems" (Csikszentmihalyi and Larson, 1984, p .206).

Motivation--The dimension on the ESM response sheet comprised of the components, wish-doing activity, control of actions, free-constrained, and

involved-detached. Motivation has to do with "analysis of the various factors which incite and direct individuals' actions" (Atkinson, 1964, p. 1).

Other Curriculum Classes--Secondary school curriculum classes other than physical education.

Physical Education Class--Secondary school physical activity classes. These may be construed as flow potential classes (Csikszentmihalyi, 1975). Csikszentmihalyi and Larson (1984) included physical education with what are referred to as high flow type classes in this investigator's research. Since physical education classes provide a unique form of physical, participatory activity as compared to high flow type classes, physical education classes are being compared separately in this investigation.

Pleasure--The feeling of satisfaction resulting from fulfilling one's basic needs such as hunger, sex, etc. "[T]he experience of pleasure tends to be one of low complexity, since it does not require the use of complex skills" (Csikszentmihalyi, 1975, p. 54).

Response Alert Signal(RAS)--The specific signal which alerted subjects to respond by completing a self-report form. This signal was given on the school's public address system: "Pardon this interruption, please. Students, please respond at your

convenience."

Response Sheet- The ESM information sheet subjects completed at each alert, which reflected their actions, thinking, mood, and other expressions of their experience. This response sheet includes several elements. As students received a random signal, they responded by completing the statements at their earliest convenience. The Response Sheet is comprised of statements relative to subjects' "objective situation and their subjective state" (Larson and Csikszentmihalyi, 1983, p. 4) when they were alerted. A copy of the Response Sheet is located in Appendix A.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

Research literature was reviewed to identify the status of knowledge related to the concept of flow, adolescent feelings in the classroom, and research employing the Experiential Sampling Method. The literature on flow was divided into sections including (a) play, enjoyment, and flow, (b) flow and peak experiences, and (c) the flow model. The examination of the literature on adolescent feelings in the classroom was divided in sections including (a) adolescent perceptions and freedom in the classroom, (b) intrinsic learning and enjoyment in the classroom, and (c) the right to enjoyment in school.

Flow

Play, Enjoyment, and Flow

Play is a means for individual experimentation in the development of skills (Csikszentmihalyi, 1974-75). This experiential process allows one to recognize opportunities for personal development and to accept challenges to acquire skills and experiences enjoyably. This activity suggests "intrinsic motivational rewards of

its own" (Csikszentmihalyi, 1974-75, p. 42). Csikszentmihalyi (1974-75) emphasized that "regardless of whether it decreases anxiety or increases competence, play is fun" (p. 42). Csikszentmihalyi (1974-75) identified play as the most obvious means to experience flow, but at the same time indicated that "play is not synonymous with flow" (p. 44).

The interrelatedness of play and enjoyment is recognized by Harris (1978) as both synonymous and dichotomous in nature. Elaborating upon the differentiation of enjoyment and play, Harris (1978) explained "that enjoyment can exist in other situations which are not usually considered to be play" (p. 60) and that "work and play are not necessarily the opposite" (p. 62).

Flow and Peak Experiences

A predecessor of the concept of flow and an exponent of experiential states, Abraham Maslow (1962) identified certain elements as "peak experiences" (p. 10), with qualities similar to those described by Csikszentmihalyi (1975) in numerous examples of individuals experiencing peak episodes.

Maslow (1962) described elements of the peak state as a loss of "self-consciousness" (p. 9), a significant element related directly to Csikszentmihalyi's (1975)

flow state, the merger of action and awareness, stemming from intensified involvement or concentration. Similar elements are described by those who have experienced a peak episode (Maslow, 1962; 1968).

Both peak and flow episodes (Csikszentmihalyi, 1975; Maslow, 1968; 1970) recognize the element of time and space alteration, where one views the perceptual-experiential world more clearly (Csikszentmihalyi, 1975; Maslow, 1968). In the classroom students would "experience in personal terms...their subject matter in reference to [themselves] and [their] ends" (Maslow, 1968, p. 82), and an important component of learning would be encouraged--an element of personalized education. Teachers strive to incorporate this aspect of learning each day in the classroom: immersion in the topic at hand.

Maslow (1962) anticipated Csikszentmihalyi's concept of "feeling of control" and "time alteration" when he stated that moments in the peak experience indicate that "separateness and distance from the world disappeared as [individuals] felt one with the world, fused with it, really belonging in it and to it, instead of being outside looking in" (p. 9). This fusion seems to identify similar elements of a non-contradictory relationship involving immediate feedback.

A final unifying point shared by Maslow and Csikszentmihalyi is that both the peak experience and the flow experience "will help us understand each other better" (Maslow, 1962, p. 12). The benefit of peak experiences, like flow experiences, is that "in normal perceptions of self-actualizing people and in the more occasional peak experiences of average people, perceptions can be relatively ego-transcending, self-forgetful, egoless. It can be object centered rather than ego centered" (Maslow, 1968, p. 79). Maslow (1968) represented the individual as a receiver of this peak-flow potential, in that one has little control over its occurrence. We cannot command the peak experience. It happens to us" (p. 87). Csikszentmihalyi and Larson (1984) indicated that it may be possible to create flow potential situations if we recall the structure of the flow experience (Csikszentmihalyi, 1975), which permits identification of flow characteristics in a variety of settings, including the classroom and the school.

The Flow Model

Csikszentmihalyi's "flow model" defines enjoyment as

> a balance between the challenges of an activity and the skills of the participant. Anxiety is defined as an imbalance between challenges and skills such that perceived challenges are greater than one's sense of skill. Boredom sets in when one's skills

> are greater than the challenges of an activity. When skills and challenges are equal and greater than zero, experience is optimal, and it is called flow (Chalip, et al., 1984, p. 109).

Csikszentmihalyi's (1974-75) model (see Figure 1 on page 7), representing the structure of flow activities, suggests that individuals can control their entrance to and exit from the flow experience depending on one's perceptions of personal skill and challenge. This conceptual representation includes two factors within a single framework: first, the recognition that individuals have "action opportunities" or challenges and, second, that they have "action capabilities" or skills within an environmental setting (Csikszentmihalyi, 1974-75, p. 56).

Because we do not all derive the same rewards from the same activities, it may be useful to categorize individuals according to the situations in which one experiences flow. A "flow profile" "might become a dynamic means to describe people for the purpose of finding the best match between the potential and the demands in the environment" (Csikszentmihalyi, 1974-75, p. 61).

Another important question in the effective use of this model is practicality, whether it is possible and feasible to "restructure standard settings for

activities [e.g., jobs, schools, neighborhoods, family interactions, etc.] in such a way as to increase the flow experiences they provide" (Csikszentmihalyi, 1974-75, p. 61). Csikszentmihalyi (1975) indicated that a balance in the challenges involved and the skill available does make a difference in these instances. Flow is semantically close to Maslow's (1968) "peak experience." Flow theory, however, has the value of being more highly explicated by "specifying both the elements of the experience and the structure of activities in which it typically occurs" (Mayers, 1978, p. 8). "The flow model attempts to bridge the gap between relatively rare peaks of experience and the more common experience of being very much involved in an activity; it thereby opens up the potential avenues for increasing enjoyment by changes within the individual, the situation, or both" (Mayers, 1978, p. 8).

Because great variability in the type of flow activity exists, so may some differentiation of intensity. What these activities do "have in common is a structure in which individuals are able to perceive challenges, or opportunities for action, which match their perceived skills, or capabilities" (Mayers, 1978, p. 8). The determination of the presence of a flow state would depend on one's "perception of what the challenges and

skills are, as well as the balance between them" (Mayers, 1978, pp. 8-9).

Although flow is frequently experienced in activities such as

> games, art, and rituals, the theoretical model [may be a means] to indicate that flow can be experienced in any activity, including work and school, when the individual perceives the opportunities for action and his or her capabilities to be in balance. Therefore, the theory leads to the expectation that when students perceive a balance of challenges and skills in their classes they will experience positive affect and involvement (Mayers, 1978, p. 9).

This involvement and the manner in which one perceives it may manifest itself in a flow experience.

Adolescent Feelings in the Classroom

Adolescent perceptions and freedom in the classroom

Feeling free is an experience which results from "being in control of one's actions, of not being determined by outside forces" (Csikszentmihalyi and Graef, 1979b, p. 84). This feeling is continually stifled by the strictures and structures of society's institutions. School is one of these institutions through which most people must pass.

Csikszentmihalyi and Graef (1979b) determined that people feel least free at work and most free when involved in leisure activities. This observation is corroborated by others (Csikszentmihalyi and Larson,

(1984). Mayers' (1979) research shows that the "more students perceive their classes to be like flow activities, the more positive is their mood in class and the greater is their desire to be there" (p. 40).

Perceptions of circumstances and experiences may reflect feelings of freedom. The potential to alter one's perceptions of an environment portends the capability to create a new set of circumstances. Consequently, one may have the potential to create a new, more positive set of feelings about one's surroundings, whether it be work or leisure.

Csikszentmihalyi and Graef (1979b) further revealed that "the wish to be doing something else was consistently stronger when [one perceived] what he or she was doing as compulsory" (p. 90). Interestingly, "no matter <u>what</u> people were doing, when they wanted to do it, they noted themselves as significantly more cheerful than when they were doing the same thing but feeling unfree" (p. 90). Csikszentmihalyi and Graef (1979) found that when one "feels an activity to be freely chosen, regardless of external conditions, that person is more cheerful, happier, and more involved with the task at hand" (p. 98).

Mayers (1978) found that, in classes where challenges and skills balanced (C=S), students wished

most to be in class and indicated characteristics of activation. In classes where skills were greater than challenges students reported feelings of being in control, that it was relatively easy to concentrate, but concentration levels were low. Self-consciousness was also low in these classes. In classes which students perceived as having challenges higher than perceived skills, students expressed low levels of control, moderately high levels of concentration, but with great difficulty in concentrating. Students in these classes indicated feelings of self-consciousness. In classes in which students perceived the challenges and skills to be in balance and high, students also perceived a high degree of control, moderate levels of concentration and some difficulty in concentrating. Self-consciousness was present as well.

The implications of creating classroom environments in which students feel freed are limitless, especially if one considers the creative adaptability, and innate feelings of freedom, and intelligence of adolescents.

Intrinsic Learning and Enjoyment in the Classroom

"Children who do not see themselves as efficacious in a particular setting...tend to withdraw from the situation, have a negative mood in or about the situation, and/or be less active in it" (Lerner, 1982, p. 362).

This lack of control enhances the possibility of their failure and probably reduces the chances of their retaining the subject matter. Csikszentmihalyi et al. (1977) found that homework and classes were perceived by students as "challenging and providing high stakes though they were also seen as constraining and boring" (p. 292) and relatively negative.

Larson et al. (1980) determined that "adolescent mood variability interferes with capacity for deep involvement, especially in school" (p. 469) and that an "individual's mood at a particular moment establishes the whole nature of his relationship with the world" (p. 488). Mayers' (1979) found that moods are related to school performance.

These factors have special relevance for teachers because their task is "to engage students with abstract topics having little immediate relevance" (Larson et al., 1980 p. 488). Larson et al. (1980) noted that many teachers use gimmicks or assume entertaining personalities to get and hold students' attention. The more difficult approach to this dilemma, they assert, is to "see teenagers' short attention span as a challenge and attempt to engage them in enduring involvements" (p. 488).

Mayers (1978) found that "when students have

classes which are too easy, they tend to enjoy them rather than being bored" (p. 90), probably because of the recognition, praise, and approval of teachers and peers, as well as the good grades. Mayers (1978) interpreted these students' reactions to mean that "extrinsic rewards provide compensation for the relative absence of challenges" (p. 90).

Mayers (1978) interpreted some elements of classes as "benign and vicious" (p. 96) circles of student development. That is, the more students enjoy certain classes, the better they perform, and the better they perform, the more they enjoy them. Intrinsic motivation, both in the classroom and in doing necessary homework" (p. 95), seems an important role in this process. Mayers (1978) also asserts that extrinsic rewards and punishments can momentarily gain student attention in class or in doing homework but points out that "teachers know very well how fragile is attention purchased in this way, how shoddy the product it generates often are, and how costly it is to the teacher to sustain in terms of time, energy, and emotion" (p. 95). In most classroom environments, either challenges or skills predominate, and "the system of extrinsic rewards and punishments motivates compliance.

In the face of this circumstance, school resources

seem wasted in "forcing students to take courses in which they are not interested and which they resist by sabotage" (Mayers, 1978, p. 97). This system also may foster a "developing hatred of learning and a posture of grubbing after grades and cramming into closed minds" (p. 97) content which seems neither interesting nor practical.

Mayers (1978) maintains that if the primary concern of educators is "engaging the attention of adolescents in ways the teacher and the school deem essential, then flow classes accomplish this by means of intrinsic rewards" (p. 93). However, in classes where students perceive themselves as overloaded by challenges, "extrinsic rewards and punishment are likely to be needed to induce the students to make the effort to concentrate" (p. 93). In classes where skills are perceived as greater than challenges, students reported enjoying the class, received good grades, and had little difficulty concentrating. Because one's intention to be bored or to enjoy the next moment is greatly affected by one's surroundings, flow experiences can be facilitated by a "structured setting modified to allow the individual the opportunity to interact in whatever manner is intrinsically rewarding to himself" (Csikszentmihalyi, 1976, p. 89).

According to Campbell (1976) new heights of

national affluence have been achieved in the preceding quarter century, with Americans defining "happiness in in monetary terms" (p. 117). Greater affluence, however, has been accompanied by an epidemic rise in violence, crime of all types, drug abuse, and family fragmentation, and as a result many people "find it hard to believe that the quality of life has been greatly enhanced during this period" (p. 117). Schools have often been charged with responsibility for present social conditions because, at the same time they are expected to combat these problems, they are viewed as breeding grounds for some of them.

The Right to Enjoyment in School

The right to enjoyment is due to all. Few may perceive that this potential exists, yet each day researchers (Csikszsentmihalyi, 1975; Csikszentmihalyi and Larson, 1984; Meyers, 1978) acquire more proof that enjoyment through the flow experience can be incorporated into most of what is contended to be work, including school.

Although the Protestant work ethic implies that work is not supposed to be enjoyable, Csikszentmihlayi and Larson (1984) indicate strongly that work can be, and often is, enjoyable. Some researchers even assert that "[w]ork is potentially as enjoyable, if not more enjoyable, than play" (Csikszentmihalyi and Larson,

1984, p. 25).

Mayers (1978) theorized that students may gravitate toward seemingly easier (C<S) classes because of the nature and structure of school. Some students believe they are compelled to attend school, with teachers establishing and evaluating to a degree its rules, tasks, rate of progress and so forth. Students may circumvent this complex set of events, over which they may feel they have little control, by enrolling in easy, but quite enjoyable classes.

When perceived challenges begin to exceed skills in a flow activity, students may become frustrated. In these instances students must not only be aware of what is happening but must be able and willing to restore the relative balance to their environment. Mayers (1978) indicated that this restoration to balance (C=S) may be attained "either by increasing one's perceived skills until they match the perceived challenges, by reducing the challenges until they correspond with the skills" (p. 91), or by combining the two. The students' intent, Mayers (1978) contends, is not only to reestablish the balance of these elements but, more importantly, to create "the positive experience of enjoyment" (p. 91).

Mayers (1978) also found that, in classes where

perceived challenges equalled perceived skills, students enjoyed the experience, concentrated best, would attend class even if not required to, and found time to pass most quickly. Even though these classes were perceived as enjoyable, students were still self-conscious, yet exhibited the highest levels of activation and wished most to be there.

In classes where challenges exceeded skills, Mayers (1978) found high levels of concentration, but difficulty in concentrating. In classes where challenges were perceived as less than one's skills, both concentration levels and ease of concentration were low.

Even though the American educational system seems formatted toward compulsory learning, the individual as well as society may benefit if the student enjoys learning. "Enjoyment shapes the growth of the self by focusing attention on goals that require increased skills for growth for their achievement" (Csikszentmihalyi and Larson, 1984, p. 26). Enjoyment may be the key to growth in any task.

Research Employing the Experiential Sampling Method

The Experiential Sampling Method has been used in a number of research projects (Csikszentmihalyi et al., 1977; Graef et al., 1978; Csikszentmihalyi et al., 1979a; Larson, 1979; Gianinno et al., 1979; Larson

and Csikszentmihalyi, 1980; Roberts et al., 1981; Larson et al., 1982; Graef et al., 1983; Csikszentmihalyi and Larson, 1984). In several of these studies the ESM was employed to investigate the daily life experiences of individuals, with school being a part of some of these experiences.

These studies generally employed a similar format, using a paging device to alert subjects. On a random alert signal, subjects would complete a Response Sheet including a variety of objective and subjective information, as well as location, feelings, challenges, skills and so forth. In most instances an important element of the research was not only the determination of moods and objective information but the relationship of challenges and skills as perceived by subjects. Thoughts and actions were also investigated. Although each dimension was indicative of a particular aspect of the subject's immediate state of mind, the emphasis in several of these studies, as in this research, was the relation between the two dimensions of perceived challenge and skill, or flow.

CHAPTER III

PROCEDURES

This chapter is divided into seven main sections: (1) the Experiential Sampling Method, (2) objective components of the Experiential Sampling Method, (3) subjective components of the Experiential Sampling Method (4) Response Sheets, (5) selection of subjects, (6) data collection, and (7) data analysis.

The Experiential Sampling Method

"The Experiential Sampling Method (ESM) is a research procedure for studying what people do, feel, and think during their daily lives. It consists in asking individuals to provide systematic self-reports at random occasions during the waking hours of a normal week" (Larson and Csikszentmihalyi, 1983, p. 1). This researcher applied it to the school experience of secondary students. Using these reports from approximately 310 secondary school students created "an archival file of daily experience" (Larson and Csikszentmihalyi, 1983, p. 1).

The Experiential Sampling Method, developed by Reed Larson and Mihalyi Csikszentmihalyi at the University of Chicago (Larson and Csikszentmihalyi, 1983), assists in

determining to some extent the degree to which an activity or experience may be intrinsically rewarding to the student. An important aspect of this data collection method and any subsequent pattern of affective responses is the students' opportunity to communicate an immediate response indicating an intrinsically rewarding experience. The ESM provides the opportunity to ascertain experiences adolescents really enjoy, the patterns of habit and thought they are following, the threats and pressures they feel, as well as the loneliness they endure. To comprehend "where [adolescents] are headed, we need to consider the influence these realities are having on their development" (Csikszentmihalyi and Larson, 1984, p. 32). The Experiential Sampling Method offers the opportunity to investigate these factors.

To understand the most effective means of encouraging a student to learn, as much information as possible must be known about how a student feels and what a student thinks within the environs of a classroom. The unique advantage of the ESM is that it allows this intervention into the class itself to discover and explore specific subjective responses which can later be analyzed objectively.

Coleman et al. (1982) determined that "the

majority of high school students appear to enjoy working hard in school and are interested in school" (p. 120). If true, then we must know not only to what extent but in what areas this enjoyment exists and for what reasons. The ESM offers a means of obtaining student insights which identify their feelings and thoughts in a classroom climate. These measures can "affect student satisfaction and morale" (Moos, 1979, p. 184) as well as student incentive to learn. Moos (1979) indicated that research tends to focus on subjective student responses as a means of exploring such avenues as the student's "sense of control and self-responsibility for learning, cognitive preferences, continuing motivation to learn, and student satisfaction with the school and class setting" (p. 184).

Larson and Csikszentmihalyi (1983) believe the Experiential Sampling Methodology allows examination of the "psychological life space" (p. 1) to better "understand the forces that structure daily thought and behavior" (p. 1). These data answer numerous questions: In what manner do adolescent students spend their school time? What are their moods and feelings in the course of various school classes? How do adolescent students vary in their day to day states with regard to affect, activation, cognitive efficiency, and motivation? These

answers are represented in the ESM response sheet, as well as student perceptions of challenges and skills.

"The objective of this method is to obtain self-reports for a representative sample of moments in peoples' lives" (Larson and Csikszentmihalyi, 1983, p. 4). To facilitate this collection, subjects were randomly alerted by a signal over the intraschool communication system. The signal was "their cue to fill out a self-report questionnaire, asking about their experiences at that moment in time" (p. 4).

Although early studies related to the ESM included observational methods and diary techniques, "the focus was on behavior, with little attention to how people think or feel in different parts of their lives. Most psychometric research has attempted to measure stable traits rather than daily experience" (Larson and Csikszentmihalyi, 1983, p. 2). Acknowledging that the "Experiential Sampling Method is not a panacea," Larson and Csikszentmihalyi (1983, p. 3) nevertheless believe that it is a means of securing valuable data.

Coleman et al. (1982) indicated a concern with large-scale surveys, a feature which the ESM overcomes, because of their "superficiality of measurement" (p. xxvii). "Schools do make a difference" (Coleman et al., 1982, p. xxvi) in the quality of adolescent life

and should be studied by methods which deal more intimately with the individual, as does the ESM.

Although the ESM is limited, "it appears to overcome some of the constraints of previous methods by combining the ecological validity of diary approaches and the rigorous measurement techniques of psychometric research. The ESM response sheet: 1) obtains information about private as well as the public parts of peoples' lives, 2) secures data about both behavioral and intra-psychic aspects of daily activity, and 3) obtains reports about peoples' experience as it occurs, thus minimizing reliance on memory and reconstruction" (Larson and Csikszentmihalyi, 1983, p. 3).

Larson and Csikszentmihalyi (1983) shun exclusively behavioral approaches which have "laudable scientific rigor, but neglect" (p. 1) concerns with more personal, internal, and unobservable aspects of existence. Observational methods have the "drawback of being useful only for studying public behavior" (p. 1). Larson and Csikszentmihalyi (1983) sought some means of following subjects "into the private segments of their lives without disrupting the phenomena to be observed" (p. 1).

Although "[d]iary techniques proved a reliable means for investigating people's lives across all parts of the day... the focus was on behavior, with little

attention to how people think or feel in different parts of their lives" (Larson and Csikszentmihalyi, 1983, p. 1). The ESM shifts from the "study of stable traits toward a focus on how situations and contexts affect people's subjective experience" (p. 3). Larson and Csikszentmihalyi (1983) indicated that problems exist regarding the use of questionnaire and interview measures "for assessing stable personality traits" (p. 3), primarily in the subject's ability to accurately restructure "their experience after the fact" (p. 3).

The Experiential Sampling Method has been used with the subject of the research carrying an electronic paging device for a period of one week. Although this particular investigation did not involve the use of electronic pagers, the reader should understand the value and nature of the pager approach. Like the devices which physicians often carry, electronic pagers are a means of contacting or alerting the individual carrying the device. Activating the device results in the emission of a beeping sound. More recent editions also include the option of alerting the individual through silent vibrations instead of the beeping sound (Mayers, 1978). On receiving each random signal, participants respond to questions about their "objective situation and their subjective state at that moment" (Larson and

Csikszentmihalyi, 1983, p. 4). In doing so, Csikszentmihalyi and Larson (1984) measured subjective and objective elements. Objective components concern "the frame of events and behaviors: with daily situations as they impinge on a person's consciousness. Subjective components have to do with the quality of consciousness: with how a person thinks and feels during daily life" (p. 44).

Objective Components of the ESM

Objective components of experience are classified into two categories: "where the adolescents [are], [and] what they [are] doing at the time of the signal" (Csikszentmihalyi and Larson, 1984, p. 44). The initial external element, location, is determined by "the students' response to the open-ended question 'As you were [alerted] where were you?'" (p. 44). Because all respondents were in a classroom in this investigation, this response was used to indicate the particular subject of the class the student was attending.

The second external coordinate was the student's activity. This element was indicated on the response sheet by the item which asked "As you were [alerted] ...what was the MAIN thing you were doing?" (Csikszentmihalyi and Larson, 1984, pp. 44-45). These responses were categorized according to what the students

were thinking and doing at the time of alert. These categories included doing classwork, doing work for another class, doing social personal things, doing nothing, thinking about things outside school, thinking about social personal things, thinking about another class, and thinking about classwork.

Subjective Components of the ESM

The subjective components of the ESM response sheet included items dealing with the subjects' "perceptions of their current social situation" (Larson and Csikszentmihalyi, 1983, p. 4) through semantic differential type scales. These components are represented on the ESM response sheet in four groupings: motivation, affect, activation, and cognitive efficiency. Csikszentmihalyi and Larson (1984) employed "items having opposite mood terms at the end of a seven-point scale. One end of the scale represents the positive emotional state (for example, happy, [cheerful]...), whereas the other end represents the negative emotional state (for example sad, [irritable]...)" (p. 47). Subjects indicated their status on each scale each time they were alerted.

Motivation

The first of the subjective components, motivation, included the students' perceptions regarding control over their present actions, whether they wished to be

doing the present activity, and their perceived sense of freedom and involvement. Motivation in this sense refers to the "mechanism by which a person chooses goals in which to invest psychic energy and keeps the energy focused on the goal" (Csikszentmihalyi and Larson, 1984, p. 46).

Motivation, the extent to which an individual actually wanted to be doing whatever he or she was doing, was indicated on a ten-point scale from "not very well" to "very well" for the items "wish doing activity," and "control of actions." For the items "free-constrained" and "involved-detached" subjects indicate their responses on a seven-point scale. The Response Sheet is shown in Appendix A.

Affect

The component of affect was represented on the ESM response sheet by the items happy-sad, cheerful-irritable, sociable-lonely, and friendly-angry. Subjects indicated their negative or positive status on a seven-point scale (e.g., from very happy to very sad).

An indication of a negative emotional response "means that negative emotional feedback has been obtained, that the person has failed to meet some of his or her goals" (Csikszentmihalyi and Larson, 1984, p. 46). A positive response "like happiness or joy indicates that the

person's goals are being achieved" (p. 46). These responses may indicate "an internal condition of consciousness as a whole--whether it is basically positive or negative" (p.46) and may have been related to events outside school.

Activation

The component of activation was represented on the ESM response sheet by the items alert-drowsy, active-passive, strong-weak, and excited-bored. Subjects follow the same response pattern as for affect and indicated their negative or positive status on a seven-point scale (from very alert to very drowsy). Again, the items at each end represented either the positive state, such as strong, or the negative state such as weak. Subjects indicated their position on the scale each time they were alerted.

Cognitive Efficiency

The component of cognitive efficiency was represented on the ESM response sheet by the items, "How well were you concentrating?", "Was it hard for you to concentrate?", "How self-conscious were you?" and by confused-clear on the semantic differential list. These elements referred to the "activity by which consciousness interacts with the environment, and transforms meaningless stimuli into useful information" (Csikszentmihalyi and

Larson, 1984, p. 46). On the first three items, subjects rated themselves on a ten-point scale. On "clear-confused," they rated themselves on a seven-point scale. Using these eleven representative items paired in the semantic differential format, Larson (1979) constructed a scale of composite mood. Other items included the subjects' perceptions of skills in the activity and its perceived challenges. Students had an opportunity to comment at the bottom of the Response Sheet.

By providing daily experiential information about one's time usage, thoughts, reflections, emotional patterns, and cognitive states, the ESM potentially is a powerful means for understanding both an individual's life amd the individual (Larson and Csikszentmihalyi, 1983). Larson and Csikszentmihalyi (1983) reported that in its previous use, participants found the ESM to be "interesting and rewarding" (p. 5) and that participants "seemed to be positively motivated to fill out the self-report forms" (p. 5). The subjective, experiential world may be clarified by the ESM's capability to gather subjective data to be treated quantitatively. This procedure allowed immediate access to the feelings, thoughts, and emotions of subjects within their natural contexts and provided the

authenticity which objectivists are likely to omit.

The Experiential Sampling Method was designed "for gathering self-reports of the thoughts, activities, and feelings of persons" (Larson, 1979, p. 32) by collecting experiential data in a student's classroom life. Drawing upon the objective and subjective elements available through the ESM response sheet was not only more effective and interesting but more valid as well in revealing an accurate picture of the adolescent scene in the classroom.

This research was designed to "provide a systematic account of adolescent '<u>experience</u>' of the subjective reality that unfolds in the consciousness of teenagers... in school" (Csikszentmihalyi and Larson, 1984, p. 8). The experiential approach was employed because "the most important events in life are internal ones" (p. 8). This investigator contends that there is at least as much to be learned from what adolescents <u>feel</u> and what they relate to us about those feelings, thoughts, and motives as from their behavior. The data produced in this research were unique because they were comprised of many "self-reports" made by adolescent students at random times during their classroom day.

<u>Response Sheets</u>

The Response Sheet (see Appendix A) was the means by

which data were recorded and collected. This method of self-reports was arranged with administrators, teachers, and students. During a period of one week, students were alerted by the school intracommunication system. One student in each class was asked to distribute and collect the Response Sheets at each alert, after which they were collected and returned to the school office. Students were informed that they might be alerted at any class time between 8:20 AM and 2:40 PM each day. At each alert, each student completed a Response Sheet which took approximately two minutes, indicating where they were, what they were doing and thinking, their mood, and certain aspects of the quality of their experience (Mayers, 1978). Students were encouraged to be at school each day during the course of the investigation.

Students were familiarized, in a group meeting, with the Response Sheet and the response alert signal (RAS) as well as the method in which they were to respond. The alert signal was identified as "Pardon this interruption, please. Students, please respond at your convenience." If teachers found that students could not respond immediately, they were requested to have them do so as soon as possible and convenient, given the classroom situation. If absolutely necessary, because of extreme inconvenience or a crucial classroom

situation, the teacher could deem it best for students not to respond. The final determination was the instructor's.

In the group explanation regarding the Response Sheet, each item was reviewed and questions were encouraged. Students were advised on how to deal with friends and family members regarding their participation. Mayers (1978) found success in encouraging participants to "feel free to show friends and family" their Response Sheet questionnaire and "what they were doing" (p. 15). Mayers (1978) suggested further that students might be more comfortable deciding individually "how much and with whom to share their [Response Sheets]" (p. 15).

Students were informed in the group meeting that, for the coming week it would be important that they complete as many response sheets as possible, as close in time to the signal as feasible, and with as few omissions as they could manage (Mayers, 1978). The students were alerted approximately fourteen times in class during the one-week data collection period. The alerts took place on two non-consecutive days within the designated week, a timing which specifically allowed for two alerts per class.

Two options were considered for use specifically with physical education classes. When the physical

education class met outside, the investigator announced the RAS through a portable loudspeaker device. When the physical education classes met in the gymnasium, either a portable loudspeaker or the intraschool communication system was used because of the noise level. Students were reminded of the importance of their contribution and thanked for their cooperation and assistance.

Each student was requested to note any questions he or she had and to call them to the attention of the investigator through the teacher. Although no questions were raised, this awareness allowed the investigator the opportunity to more effectively oversee the completeness of the Response Sheets.

Selection of random moments was by lots. To better insure uniformity of responses and to allow for beginning and ending classes, students were not alerted during the first and last five minutes of classes. In maintaining the integrity of the investigation, Larson and Csikszentmihalyi (1983) indicated that it is "essential that the set of signals be representative and that they occur without notification to the person receiving them" (p. 5). "[T]he intent [is] to secure a data base which is representative of people's lives during a typical week" (p. 5). An accumulation of data

"from many individuals thus provides an archive of information about daily experience--how people spend their time...and how they feel in different contexts" (p. 5). All scores were standardized to a nine point scale to facilitate comparison.

Subjects

Approximately 310 secondary-school students and 28 teachers participated in this investigation. The students were in grades 10 through 12 and included the total student population. This research was explained to students and teachers as the investigator's attempt to better understand adolescent feelings and experience in different school situations.

Accommodation of Human Subjects Ethical Standards

The Review Committee for The Use of Human Subjects in Research at the School of Health, Physical Education, Recreation, and Dance at the University of North Carolina at Greensboro employs stringent guidelines for the use of human subjects. Prior confirmation of specific information insured that subjects consented to participate in the study without duress and could withdraw at any time. The informed consent forms for students and teachers were distributed; they returned returned the signed forms to the investigator prior to participation in the study. A copy of the form as

approved by the School Review Committee and used by the subjects is found in Appendix C.

The Agreement With the School and School System

The administration of the cooperating school and school system stipulated several requirements to be met by the investigator: (1) Agreement to insure the rights and privacy of participating students and teachers; (2) a consent form signed by each participating student and teacher; (3) assurance that participants received clear instructions before the onset of the research. Classwork and classroom decorum always came first and that at no time would the research activities be allowed to interfere with crucial classroom activities; (4) assurance that cooperating teachers in each class had final authority in any questionable classroom instance; (5) explanation of the benefits which would accrue to participating students and the school. All of these stipulations were met.

Cooperating teachers were informed that students would be alerted once each class on two non-consecutive days. Upon each alert, students and teachers would be asked to complete a Response Sheet at their earliest convenience in class. At no time, however, was the response to be made at the expense of immediate attention to crucial classroom responsibilities.

Cooperating teachers were assured that no attempt would be made to discredit, isolate, or investigate any teacher, that the only agenda was to evaluate student responses to their feelings of "flow" centering around their perceptions of challenge and skill in a learning setting, and that any comparison would involve student perceptions of "flow" in physical education classes, "high flow type" curriculum classes (such as music, industrial arts, art), and "low flow type" curriculum classes (such as mathmatics, foreign language, and English).

Data Collection

Data were collected during the week of April 7-11, 1986 on the ESM Response Sheet, a brief questionnaire filled out by cooperating students and teachers. A copy of the Response Sheet is found in Appendix A.

This study entailed minimal periods (approximately 2 minutes) of slight interruption in each class for 2 days within a period of one week. The investigation resulted in approximately fourteen classroom responses per student over two non-consecutive days or approximately 4,300 student responses.

Analysis of Data

Data for question 1 were treated descriptively by examining the means and standard deviations. Data for

question 2 were treated descriptively by examining the thoughts and actions of students in physical education, high flow type classes and low flow type classes. Description was in percentages and frequency of response. Data for question 3 were treated descriptively and examined for frequency of flow among physical education, high flow and low flow type classes.

The univariate F test was purposely not employed because student responses are not independent. Varying numbers of responses were obtained from different students. Furthermore, since the subjects were not a random sample of a larger population, no generalization beyond the finite student population of this school is made.

Chapter IV

RESULTS AND DISCUSSION

This chapter is divided into sections to address the questions by summarizing and discussing the findings.

Question 1

> Are there any differences among physical education, high flow, and low flow type curriculum classes on the dimensions comprising the components of cognitive efficiency, motivation, activation, and affect, as well as challenge and skill.

Question 1 provided the framework within which the variables in the three types of classes were investigated. Data were examined to determine the means and standard deviations of the dimensions of three types of classes. A summary of these findings is found in Tables 1-5.

Thirty-nine physical education responses were tabulated while there were 263 high flow student responses and 1608 low flow student responses. There were fewer physical education and high flow type classes than low flow type classes. If students incorrectly or partially filled out a Response Sheet, these were eliminated reducing the number of usable responses even more. It is also possible that some students did not respond. Of

4300 anticipated responses, 1910 were usable.

Each of the components of cognitive efficiency, motivation, activation, and affect is divided into four dimensions and a subtotal score. The means for the 0-6 scale on the Response Sheet were converted to 0-9 to consistently report data in text and tables. In each of Tables 1-5 the higher mean score on each dimension is most desirable.

Cognitive Efficiency Component

Group Means of Cognitive Efficiency Dimensions

The investigation of the dimensions within the component of cognitive efficiency was important in that these dimensions were indicators of the level of consciousness with which the student was interacting with the environment. This dimension may also represent the degree to which information was transferred in the class (Csikszentmihalyi and Larson, 1984).

Examination of the cognitive efficiency component in Table 1 revealed that, with the exception of physical education and high flow type classes on ease of concentration all three class types rated above the middle point (>4.5 on 0-9) scale) on each dimension.

Interestingly, students in physical education and high flow classes concentrated with about same ease, even though physical education students appeared to

Table 1

Summary of Means and Standard Deviations of Cognitive Efficiency Dimensions

Cognitive Efficiency Scale		Class Response Means: PE f=39	Low Flow f=1608	High Flow f=263
Extent of Concentration (0-9) (not well-very well)	M	7.18	5.93	5.82
	SD	2.26	2.81	3.03
Ease of Concentration (0-9) (not easy-easy)	M	4.38	4.93	4.40
	SD	3.48	3.09	3.06
Self-conscious (0-9) (very-not at all)	M	6.08	5.49	5.94
	SD	2.84	2.78	2.65
Confused-Clear (0-9)	M	7.28	6.32	6.06
	SD	1.80	1.90	2.01
Cognitive Efficiency Subtotal	M	24.92	22.67	22.22
	SD	5.12	5.30	4.65

concentrate best. The difficulty in initiating concentration may be attributable to the less rigid structure of the class. Students may have been allowed to interact more freely, possibly inhibiting concentration. However, once involvement was initiated, concentration may have focused on the activity. This process seems consistent with Csikszentmihalyi's (1975) contention that the participatory nature of many physical activities may lend itself to focusing attention.

The indications of clarity in physical education classes also seem to verify Csikszentmihalyi's (1975) assertion that increased levels of concentration may enhance clarity of one's situation. Perhaps the more clarity one experiences, the less self-conscious one is of oneself and one's participation in the activity. The level of confidence one has in skill performance may also be relevant to one's level of self-consciousness, as Chalip et al. (1984) indicate when relating performance of students' "tendency to view themselves as social objects" (p. 114).

Students in all three types of classes indicated some extent of self-consciousness, though low flow type classes expressed the most, perhaps because low flow type class students were aware of, and attentive to grades in these classes. One might be more self-conscious of

performance, grades, and so forth in more academically oriented classes because of the strong societal value placed on this type of class, whereas in low flow and physical education classes self-consciousness may not be as prevalent. Chalip et al. (1984), however, found that students were more self-conscious than average in physical education classes. This difference may be due to the large urban nature of one school versus the small rural nature of the other school.

The cognitive efficiency subtotal scores indicate that physical education classes may have exhibited a greater potential for transfering information and also seemed to be operating at higher levels of concentration. This circumstance may seem unusual because physical education may not generally be regarded as a class where such a transfer occurs.

Discussion of Means and Standard Deviations of Cognitive Efficiency Dimensions

Extent of Concentration

Data located in Table 1 indicate that physical education classes had the highest mean (M=7.18) while high flow type (M=5.82) classes and low flow type (M=5.93) classes had more comparable means. The standard deviation of 2.26 for physical education classes indicated that scores deviated less from one

another while the standard deviation (SD=3.03) for high flow type classes indicates that scores were dispersed more widely. Physical education students concentrated best.

The difference between group means for physical education classes and high flow type classes on this dimension may be partially attributable to the physical nature of the activity. Both classes are active in nature but it appears there is a difference in type and degree of activity. The more physical nature of the activity seems to be the major difference between these two types of classes.

Ease of Concentration.

Low flow type classes had the highest mean (M=4.93) while high flow (M=4.40) type classes and physical education (M=4.38) classes had more comparable means. Standard deviations for low flow type (SD=3.09) classes and high flow type (SD=3.06) indicate a similar dispersion of scores. Physical education scores deviated more (SD=3.48) than other classes.

The difference in means between high flow type classes and low flow type classes may be related to the nature of the class, akin to the more regimented and structured nature of the academic low flow type classes.

Low flow type classes had the highest mean scores on ease of concentration. The nature of these traditionally academic courses may incline students to focus more easily upon the task at hand because of fear of personal embarrassment associated with appearing foolish, failing, or concern for future jobs.

The difference in mean scores between physical education and low flow type classes may also be related to the nature of the class. The less rigid structure of physical education classes may have contributed to more informal social interaction among students, and this in turn may have contributed to the lack of ease with which physical education students concentrated.

Self-consciousness

Physical education classes had the highest mean (M=6.08) while low flow type classes had the lowest (M=5.49) on the self-consciousness dimension. The standard deviation (SD=2.65) for high flow type classes indicates that scores deviated less than physical education (SD=2.84) and low flow type (SD=2.78) classes.

The difference in mean scores on self-consciousness between high flow and low flow type classes could be related to the manner in which students perceived themselves in their class. Students in low flow type

classes may be more concerned about grades, performance, and failure than students in high flow type classes. Physical education class students could have been less self-conscious (M=6.08) than low flow type (M=5.49) class students because of the less rigid structure of the class as well as the more social atmosphere sometimes associated with physical education classes. The play and games orientation of these classes may also have contributed to less self-consciousness. The means for physical education (M=6.08) classes and high flow type (M=5.94) did not appear to differ greatly.

Confused-clear

On the dimension confused-clear physical education (M=7.28) had the highest mean while low flow type (M=6.32) and high flow type (M=6.06) class means were more similar. The standard deviation for physical education (SD=1.80) indicates that scores deviated less than high flow type (SD=2.01) or low flow type (SD=1.90) class scores although the difference was not great. Physical education students experienced more clarity in class.

The participatory and physical nature of physical education classes which give more definite, distinctive feedback about one's actions may, as Csikszentmihalyi (1975) indicated, be related to the difference between

physical education and high flow type classes.

Cognitive efficiency subtotal

On the cognitive efficiency subtotal physical education classes had the highest mean (M=24.92) while means for low flow type (M=22.67) and high flow type (M=22.22) classes were more similar. While the standard deviation of high flow type (SD=4.65) classes indicated the smallest deviation of cognitive efficiency subtotal scores, the dispersion of subtotal scores for physical education (SD=5.12) and low flow type (SD=5.30) classes is more similar.

The physical education subtotal mean indicated that students were less self-conscious of themselves as they interacted within their environment. The subtotal scores are also an overall indicator that the degree to which information was transferred in class was greater in physical education classes and more similar in high flow type classes and low flow type classes (see Table 1).

Summary of Findings of Cognitive Efficiency Components

With the exception of ease of concentration physical education classes had the highest means of the three types of classes. This indicates that physical education students concentrated most extensively, were least self-conscious and experienced greater

clarity in class. Low flow type class students appeared to concentrate with the most ease.

Motivation Component

Group Means of Motivation Dimensions

Motivation dimensions reflect student perceptions regarding control over their present actions and may indicate whether a student actually wants to be doing what he or she is doing (Csikszentmihalyi and Larson, 1984).

Physical education classes had the highest mean scores on each dimension comprising the motivation component as well as the subtotal score. High flow type classes had the lowest mean on the dimensions control of actions (M=7.19) and detached-involved (M=5.34), while low flow type classes had the lowest means on the dimensions constrained-free (M=5.84) and wish doing something else (M=2.91) (see Table 2).

Investigation of the motivation component determined that each type of class reported scores above the middle point (>4.5 on 0-9 scale) on the dimensions detached-involved, constrained-free, and control of actions. This finding with regard to the control of action dimension concurs somewhat with Chalip et al. (1984) who found that "sense of control was highest in physical education classes" (p. 112). The

Table 2

Summary of Means and Standard Deviations of Motivation Dimensions

Motivation	Scale		Class Response Means PE f=39	Low Flow f=1608	High Flow f=263
Control of Actions (not at all-very well)	(0-9)	M	7.85	7.48	7.19
		SD	1.89	2.46	2.19
Detached-Involved	(0-9)	M	6.84	5.75	5.34
		SD	1.97	1.93	2.02
Constrained-Free	(0-9)	M	7.58	5.84	6.29
		SD	1.69	1.93	1.88
Wish Doing Something Else (very much-not at all)	(0-9)	M	5.51	2.91	3.05
		SD	3.73	3.37	3.48
Motivation Subtotal		M	27.78	21.98	21.87
		SD	6.01	5.50	5.42

numerical mean scores indicated that physical education students wished least to be doing something else, felt most in control of their actions, felt freer and more involved. Perhaps this indicates students enjoyed these classes more. These responses may be attributed to the fact that physical education is traditionally more play and game oriented.

The numerical mean scores for high (M=3.05) and low flow (M=2.91) type classes on the wish doing something else dimension may indicate dissatisfaction with the class, a particular topic, the instructor, and so forth. Students in physical education classes wished less to be doing something else, a possible indication of student satisfaction with the class. The extent of freedom reported in physical education classes may be related to the extent to which students felt involved and in control of their actions in physical education.

This generally does not concur with Csikszentmihalyi and Larson (1984) who found that high school students scored above average on the dimensions of wish doing something else and control of actions, while they scored below average on the constrained-free and detached-involved items. This difference in findings may be related to a variation in the urban versus rural nature of the schools investigated, difference in size of the

school as well as the possible difference between authoritarian versus more personal nature of classroom settings.

Discussion of Means and Standard Deviations of Motivation Dimensions

Control of actions

Physical education classes had the highest mean (M=7.85) and high flow type classes had the lowest mean (M=7.19) on this dimension. All three classes indicated a high degree of control of actions. The standard deviation of 1.89 for physical education classes indicates that scores were more tightly clustered around the mean than either low flow type (SD=2.46) or high flow type (SD=2.19) classes. This indicates that while all three classes appeared to feel in control of their actions, this conclusion seems strongest among physical education students.

Detached-involved

Physical education classes had the highest mean (M=6.84) while high flow type (M=5.34) classes had the lowest. The standard deviation of low flow type (SD=1.93) classes indicated that scores deviated less than those of physical education (SD=1.97) and high flow type (SD=2.02) classes although the difference was not great.

The comparable means of low flow type (M=5.75) and high flow type (M=5.34) classes indicates a possible similarity in feelings of involvement in these classes. The difference in means of physical education (M=6.84) and high flow type (M=5.34) classes may be related to the difference in the nature of the classes. The social nature as well as the competition sometimes associated with the play and game orientation of physical education classes may account for the high levels of involvement in physical education classes. High flow type classes had the lowest levels of involvement, possibly due to lack of competition sometimes provided by the physical aspects of physical education classes and the competition provided by the more academic and more rigidly structured nature of low flow type classes.

Constrained-free

Physical education classes had the highest mean (M=7.58) and low flow type (M=5.84) classes had the lowest mean. The standard deviation for physical education (SD=1.69) indicates that scores deviated least while there was a similarity in dispersion of scores in low flow type (SD=1.93) and high flow type (SD=1.88) classes.

Physical education students felt most free (M=7.58) in class, possibly due to the less rigid

structure sometimes associated with physical education classes as well as the more socializing and more game and play oriented nature of physical education classes.

Wish doing something else

Physical education classes had the highest mean (M=5.51) and low flow type (M=2.91) classes had the lowest. The deviation of scores from one another was least in low flow type (SD=3.37) classes though the difference among classes in dispersion of scores was not great (see Table 2). Physical education students wished least to be doing something else while low flow type class students wished most to be doing something else. The play and game oriented, less rigidly structured, social and participatory nature of physical education classes may partially explain the higher mean scores of physical education classes over the more structured academic classes.

Motivation subtotal

On the motivation subtotal physical education classes had the highest mean (M=27.78) while high flow type (M=21.87) and low flow type (M=21.98) classes were more similar. The standard deviation of high flow classes (SD=5.42) indicated that scores varied less than in low flow type (SD=5.50) and physical education (SD=6.01) classes. The physical education subtotal

mean indicated that overall physical education classes were more motivated, wanted most to be doing what they were doing and felt most in control of their actions.

Differences in means between physical education and other curriculum classes may be the result of variation between the game and play oriented, social, less structured classes versus the more likely structured, traditional academic classes.

Summary of Findings of Motivation Components

Physical education classes had the highest mean on each motivation component dimension. High flow type classes had the lowest mean on the dimension control of action, detached-involved, and the motivation subtotal. Physical education students felt most in control of their actions, were most involved, felt freer, and wished least to be doing something else.

Activation Component

Group Means of Activation Dimensions

The component activation reflects a student's potential for physical and mental activity (Csikszentmihalyi and Larson, 1984). Physical education classes had the highest mean on each of the activation dimensions as well as the subtotal. High flow type classes had the lowest mean on the dimensions drowsy-alert (M=6.51), passive-active (M=4.89), and

bored-excited (M=4.00). Low flow type classes had the lowest mean on the dimensions weak-strong (M=5.73) and the activation subtotal (M=22.11). These results are found in Table 3.

With two exceptions on the activation component physical education, high flow, and low flow type classes each showed scores above the middle point (>4.5 on 0-9 scale). On the item bored-excited low flow (M=4.25) and high flow classes (M=4.00) rated below average.

Group numerical mean scores indicate that physical education students felt most alert, most active, as well as most excited, perhaps because of the social, participatory and active nature of the classes. Generally, these findings do not concur with Csikszentmihalyi and Larson (1984). Csikszentmihalyi and Larson (1984) also found that the more traditonally academic low flow type classes rated lower on activation than was the case in the present study. This difference between findings in these studies may be due in part to the size of the classes, whether the class was required or elective, and the manner in which the class was taught.

Discussion of Means and Standard Deviations of Activation Dimensions

Drowsy-alert

Physical education classes had the highest mean

Table 3

Summary of Means and Standard Deviations of Activation Dimensions

Activation	Scale		Class Response Means PE f=39	Low Flow f=1608	High Flow f=263
Drowsy-Alert	(0-9)	M	7.85	6.74	6.51
		SD	1.58	1.84	1.98
Weak-Strong	(0-9)	M	6.15	5.73	6.03
		SD	2.00	1.67	1.77
Passive-Active	(0-9)	M	7.08	5.39	4.89
		SD	1.89	1.96	2.09
Bored-Excited	(0-9)	M	6.05	4.25	4.00
		SD	1.97	2.12	2.25
Activation Subtotal		M	27.13	22.11	21.43
		SD	5.42	5.40	5.73

(M=7.85) on this dimension while high flow type (M=6.51) classes had the lowest (see Table 3). The standard deviation of 1.58 for physical education classes indicated that the scores deviated very little from each other. The standard deviations for low flow type (SD=1.84) and high flow type (SD=1.98) classes indicate a slight increase in dispersion of scores.

Physical education students were more alert, as reflected by their higher numerical mean scores. This difference may be attributable to the social nature of the class, the sedentary versus active qualities of the classes and to the participatory levels of the classes. To some extent the participatory levels have already been reflected by the physical education students' degree of involvement (see Table 2). Hence, those most involved may be most alert. The social and less rigidly structured nature of the class may also be factors in the alertness of physical education students.

Weak-strong

Physical education classes had the highest mean (M=6.15) on this dimension. Low flow type (M=5.73) classes had the lowest mean. The standard deviation of 1.67 for low flow type classes indicates that the scores deviated least in this type class. Though the standard deviation for physical education classes (SD=2.00) was

slightly higher, the dispersion of scores was not great. Students in physical education classes felt strongest while students in low flow type classes felt weakest.

Passive-active

Physical education classes had the highest mean (M=7.08) on this dimension. High flow type (M=4.89) classes had the lowest mean. The standard deviation of 1.89 for physical education classes indicated that the scores deviated very little from each other. The dispersion of scores in low flow type (SD=1.96) and high flow type classes (SD=2.09) did not vary greatly.

Physical education classes were more physically active than either high flow or low flow type classes. An obvious answer to the difference between physical education and the other curriculum classes is the degree of physical activity inherent in the class. The less rigid structure of the class as well as its more social nature also may have contributed to this level of activity.

Bored-excited

Physical education classes had the highest mean (M=6.05) and high flow type (M=4.00) classes had the lowest. The standard deviation of 1.97 for physical education classes indicates that there was little

deviation in scores. The standard deviations for low flow type (SD=2.12) and high flow type (SD=2.25) classes showed an increase in the dispersion of scores.

The higher mean for physical education on this dimension is consistent with higher physical education scores on the dimensions drowsy-alert and passive-active. The numerical mean scores may indicate that physical education students were more excited than those in low flow or high flow type classes. This may be related to the potential for social interaction, an important aspect of adolescent life, or the participatory and physical nature of the classes. Physical education students were most excited and high flow type class students were least excited, perhaps due to the manner in which the class was taught or the specific topic currently being taught.

Activation subtotal

On the activation subtotal physical education classes had the highest mean (M=27.13) while subtotal means for low flow (M=22.11) and high flow (M=21.43) type classes were more similar. The standard deviations for physical education (SD=5.42) and low flow (SD=5.40) type classes indicate a consistency of score dispersion.

The higher subtotal scores indicate that students were more active in physical education classes than in

other classes possibly because of the level of physical activity inherent in physical education classes. The social nature and less rigid structure of the class may also be related to the overall level of activity.

Summary of Findings of Activation Components

Physical education classes had the highest means on each activation dimension and subtotal. High flow type classes had the lowest mean on the weak-strong, drowsy-alert, bored-excited and subtotal dimensions. Physical education students felt more active and stronger and were more excited and alert than students in low flow type or high flow type classes.

Affect Component

Group Means of Affect Dimensions

The affect dimensions represent a positive or negative emotional state. A response in this dimension may reflect the degree to which a student has or has not met some of his or her goals (Csikszentmihalyi and Larson, 1984). A positive response may indicate that some goals were being achieved.

Physical education classes had the highest mean on each of the affect dimensions as well as the subtotal (see Table 4). Low flow type classes had the lowest mean on the dimensions irritable-cheerful (M=6.23),

Table 4

Summary of Means and Standard Deviations of Affect Dimensions

Affect	Scale		Class Response Means PE f=39	Low Flow f=1608	High Flow f=263
Irritable-Cheerful	(0-9)	M	7.11	6.23	6.27
		SD	1.73	1.77	1.81
Sad-Happy	(0-9)	M	6.93	6.14	6.12
		SD	1.73	1.63	1.76
Angry-Friendly	(0-9)	M	7.97	6.99	6.98
		SD	1.20	1.54	1.68
Lonely-Sociable	(0-9)	M	7.62	6.54	6.66
		SD	1.40	1.72	1.81
Affect Subtotal		M	29.63	25.90	26.03
		SD	4.82	5.22	5.43

lonely-sociable (M=6.54), and the affect subtotal (M=25.90). High flow type classes had the lowest mean on the dimensions sad-happy (M=6.12) and angry-friendly (M=6.98).

Students in physical education classes had the highest numerical mean scores perhaps because of the open, less structured elements of some physical education classes. These classes are sometimes categorized as play and game oriented, elements which sometimes reflect positive emotional states. The interactive nature of physical education classes may also contribute to the affect mean scores reported in physical education classes. In low flow type classes, however, the element of individual accomplishment may become important because students may be expected to work more autonomously, rather than in cooperation with other students.

The investigation of seventy-five students by Csikszentmihalyi and Larson (1984) revealed that generally students scored below the midpoint on their on the scale on all dimensions of affect. This finding by Csikszentmihalyi and Larson (1984) is in contrast to the findings of the current research. This disparity in findings may be partially attributable to the environment created in the classroom by the teachers, the size of the class, the authoritarian

nature of the teacher, or the fact that one study involved a large urban school and the other a small rural school.

This contrast was especially true on the dimensions indicating sadness, irritability, boredom, ease of concentration, self-consciousness, and wish to be doing something else. Scores above the midpoint (>4.5 on 0-9 scale) on degree of concentration were indicated in the present study. Csikszentmihalyi and Larson (1984) conjecture that, in spite of numerous negative feelings, students "do tune into class for at least some of the time" (p.205). Some of this, however, may be because "school can motivate students extrinsically with immediate punishment and long-term rewards" (p. 205).

Student feelings about the nature of the class are somewhat substantiated by the findings of Csikszentmihalyi and Larson (1984) that "classrooms provide largely negative feedback" (p. 207), while Chalip et al. (1984) concurs with this investigator's findings that physical activity provides largely a positive experience.

Discussion of Means and Standard Deviations of Affect Dimensions

Irritable-cheerful

Physical education classes had the highest mean (M=7.11) on this dimension while low flow (M=6.23) type classes had the lowest. The standard deviations of all three (PE; SD=1.73) (LF; SD=1.77) (HF; SD=1.81) classes indicated a similar dispersion of scores, although physical education scores were most clustered around the mean. Physical education students were most cheerful while low flow type class students were least cheerful. This may be partially attributable to the social, less rigidly structured and more game and play oriented nature of the class. These results are found in Table 4.

Sad-happy

Physical education classes had the highest mean (M=6.93) on this dimension. Though high flow (M=6.12) type classes had the lowest mean it was not dissimilar from the mean for low flow type (M=6.14) classes. The standard deviation for low flow type (SD=1.63) classes indicates these scores were least variable and that dispersion of scores was more comparable in physical education (SD=1.73) and high flow type (SD=1.76) classes.

Physical education students were happiest and high flow type class students were saddest, though there was

only moderate numerical difference in means on this dimension. Student happiness in physical education classes may be related to the play and game oriented, physical and participatory nature of the class. The socializing aspects as well as the less rigid class structure may also have been influencing factors.

Angry-friendly

Physical education classes had the highest mean (M=7.97) and high flow (M=6.98) type classes had the lowest. The standard deviation of 1.20 for physical education scores suggests a small variability of scores. The dispersion of scores in high flow (SD=1.68) and low flow (SD=1.54) is slightly greater. While students felt friendly in all 3 classes, students felt friendliest in physical eduation classes. Perhaps this is because of the more informal participatory structure of physical education classes which may lend itself to a more social and helpful atmosphere. The play and games oriented physical education classes may enhance the likelihood of positive interaction.

Lonely-sociable

Physical education classes had the highest mean (M=7.62) and low flow type (M=6.54) classes the lowest on the lonely-sociable dimension. The standard deviation for physical education for (SD=1.40)

demonstrates that physical education scores deviate least. The deviation of scores in low flow (SD=1.72) and high flow type (SD=1.81) classes does not differ greatly. Physical education students felt most sociable while low flow type class students felt least sociable. The feelings of sociability in physical education classes may be attributable to the physical, participatory, play and game oriented activities consistent with these classes. Physical education classes appeared to be more friendly and may have a more informal structure with a stronger network for social interaction.

Affect subtotal

Physical education classes had the highest affect subtotal means (M=29.63) while low flow (M=25.90) type classes had the lowest subtotal. Physical education (SD=4.82) had the smallest standard deviation. This signifies that scores were less dispersed than scores in high flow (SD=5.43) and low flow type (SD=5.22) classes.

Perhaps the higher means for physical education indicate that physical education students were in a more positive emotional state. It is also likely that they were achieving some of their goals as compared to other curriculum classes.

Summary of Findings of Affect Component

Physical education classes had the highest means on each affect component dimension. Low flow type classes had the lowest mean on the dimensions irritable-cheerful, lonely-sociable, and affect subtotal. High flow type classes had the lowest mean on the dimensions sad-happy and angry-friendly. Physical education students felt most cheerful, were happiest, felt friendliest, and felt more sociable.

Challenge and Skill Dimensions

Group Means of Challenge Dimension

Challenge

Physical education classes had the highest mean (M=6.36) and low flow type (M=5.37) classes had the lowest mean on this dimension. The physical education standard deviation (SD=2.68) denotes that physical education scores varied less than low flow type (SD=2.82) and high flow type (SD=2.80) class scores and that the latter two were more comparable in dispersion of scores (see Table 5).

Students in physical education classes felt most challenged possibly because of the competitive elements sometimes associated with the play and game orientation and the physical and participatory nature of the activities. Low flow type classes felt least challenged

Table 5

Summary of Means and Standard Deviations of Challenge and Skill Dimensions

Class Response Means

	Scale		PE	Low Flow	High Flow
			f=39	f=1608	f=263
Challenge	(0-9)	M	6.36	5.37	5.40
		SD	2.68	2.82	2.80
Skill	(0-9)	M	7.13	6.41	6.37
		SD	2.30	2.45	2.48

perhaps because they lack some of the same elements.

Skill

Physical education classes had the highest mean (M=7.13) on this dimension. Though high flow type (M=6.37) classes had the lowest mean, this mean was not greatly different from the low flow type (M=6.41) class mean. The standard deviation for physical education (SD=2.30) classes denotes that physical education scores deviated less than either low flow (SD=2.45) or high flow type (SD=2.48) class scores and that score dispersion was similar in both instances.

Physical education students felt most skilled possibly because of the play and game, participatory and physical nature of the class. The fact that mean scores on both the challenge and skill dimensions were lower in classes other than physical education may suggest that teachers underestimated the skill level of students and therefore intentionally taught at less than challenging levels. Teachers may also have been trying to teach all students on the same level without regard to challenging the individual student.

Summary of Findings for Question 1

A graphic summary of group means for the dimensions of each component is found in Figures 2 and 3. It is

FIGURE 2

GRAPHIC SUMMARY OF GROUP MEANS FOR COGNITIVE EFFICIENCY AND MOTIVATION

PE = A HIGH FLOW = B LOW FLOW=C

COGNITIVE EFFICIENCY:

HOW WELL CONCENTRATING NOT WELL	0.....1.....2.....3.....4.....5.....C.B6.....7A.....8.....9	VERY WELL
EASE OF CONCENTRATION NOT EASY	0.....1.....2.....3.....4..AB....C5.....6.....7.....8.....9	EASY
SELF-CONSCIOUS VERY	0.....1.....2.....3.....4.....5...C....B6A.....7.....8.....9	NOT AT ALL
CONFUSED	0.....1.....2.....3.....4.....5.....6B.C.....7.A.....8.....9	CLEAR
COGNITIVE SUB-TOTAL	0.....10.....20CBA.....30.....36	

MOTIVATION:

IN CONTROL OF ACTIONS NOT AT ALL	0.....1.....2.....3.....4.....5.....6.....7B...C..A.8.....9	VERY WELL
DETACHED	0.....1.....2.....3.....4.....5...B..C..6.....A.7.....8.....9	INVOLVED
CONSTRAINED	0.....1.....2.....3.....4.....5.....C.6..B.....7.....A...8.....9	FREE
WISH DOING SOMETHING ELSE VERY MUCH	0.....1.....2.....C3B.....4.....5....A....6.....7.....8.....9	NOT AT ALL
MOTIVATION SUB-TOTAL	0.....10.....20BCA.....30.....36	

FIGURE 3

GRAPHIC SUMMARY OF GROUP MEANS FOR ACTIVATION, AFFECT, CHALLENGE AND SKILL

PE = A HIGH FLOW = B LOW FLOW=C

ACTIVATION:		
DROWSY	0.....1.....2.....3.....4.....5.....6....B.C..7.....A.8.....9	ALERT
WEAK	0.....1.....2.....3.....4.....5.....C..B.A.....7.....8.....9	STRONG
PASSIVE	0.....1.....2.....3.....4.....B.5...C.....6.....7A.....8.....9	ACTIVE
BORED	0.....1.....2.....3.....B4C.....5.....6A.....7.....8.....9	EXCITED
ACTIVATION SUB-TOTAL	0.....10.....20BC....A..30.....36	
AFFECT:		
IRRITABLE	0.....1.....2.....3.....4.....5.....6.CB.....7A.....8.....9	CHEERFUL
SAD	0.....1.....2.....3.....4.....5.....68C.....A7.....8.....9	HAPPY
ANGRY	0.....1.....2.....3.....4.....5.....6.....BC7.....A8.....9	FRIENDLY
LONELY	0.....1.....2.....3.....4.....5.....6....CB...7.....A...8.....9	SOCIABLE
AFFECT SUB-TOTAL	0.....10.....20....BC..A30.....36	
CHALLENGE LOW	0.....1.....2.....3.....4.....5..CB.....6..A.....7.....8.....9	HIGH
SKILL LOW	0.....1.....2.....3.....4.....5.....6..CB.....7A.....8.....9	HIGH

interesting to note that physical education classes had the highest mean on all dimensions except ease of concentration, as well as on all subtotals. These differences likely had to do with the more physical and participatory nature of physical education classes. It is also possible that the play and game, less rigidly structured as well as the more social nature of physical education classes could have contributed to the differences in these classes.

Question 2:

> Are there any differences among physical education, high flow, and low flow type curriculum classes on the dimensions thought and action.

As an adjunct to the primary items on the Response Sheet, two items also represented the thoughts and actions of students as they were alerted. The Response Sheet presented two questions for the modes of "thinking" and "doing" (Csikszentmihalyi and Larson, 1984). The first question was "What was the MAIN thing you were thinking about as you were alerted?" The second question was "What was the MAIN thing you were doing as you were alerted?" Students responded to these questions indicating specifically in an open ended statement what they were thinking and doing at the moment of alert. Because the investigator was interested in the thoughts

and actions of students only while they were in school the responses were categorized by the investigator into five groups reflecting student thoughts and four groups indicating their actions. Csikszentmihalyi and Larson's (1984) investigation encompassed the entire adolescent day and consequently included more categories. They divided their responses into "seventeen content categories" (p. 50) and sixteen action categories (p. 63) for school as well as other daily activities.

Student Thoughts and Actions

Group Percentages of Thought Responses

The investigation of these dimensions was important in that when students responded they were indicating what they were thinking and consequently some aspect of their attentiveness to class. Table 6 indicates that high flow type class students reported the highest percentage (32%) of responses on the dimension thinking about social/personal things. Low flow type class students reported the highest percentage (28%) of responses on the dimension thinking about things outside school. Physical education students indicated the highest percentage (59%) of those thinking about classwork and low flow type class students reported the highest percentage (4%) of those thinking about another class. Three percent of physical education responses comprised the highest

Table 6

Percentage of Responses of Thought Dimensions

		PE	Low Flow	High Flow
		f=39	f=1608	f=263
Thinking About Social/Personal Things	%	15	14	32
	f	22	261	63
Thinking About Things Outside School	%	23	28	27
	f	19	449	53
Thinking About Classwork	%	59	54	38
	f	34	885	56
Thinking About Another Class	%	00	04	03
	f	0	75	6
No Comment	%	03	00	00
	f	1	0	0

percentage of responses indicating no comment.

Discussion of Frequency and Percentage of Response of Thought Dimensions

Thinking about social/personal things

High flow type class students reported the highest percentage (32%) (f=63) of responses on the dimension thinking about social/personal things. Low flow (14%) (f=261) and high flow type (15%) (f=22) classes were not dissimilar in percentage of responses. High flow type class students were thinking most about social/personal things. This may be attributable to the participatory nature of high flow type classes. The interactive social nature and less rigidly structured nature of high flow type classes may lend itself to thinking more about social/personal things. Physical education percentage response scores were higher than high flow type class's on both the excitement and activity dimensions (see Table 3). This excitement and level of activity may indicate that physical education class students may be less predisposed to concern about social/personal things and more concerned with class activities.

Low flow type classes and physical education classes reported thinking least about social/personal things possibly due to the nature of the classes. The

nature of physical education classes may be such that even though they may be construed as exciting and socially interactive, involvement in competitive physical activities may preclude thoughts about social/personal things. Low flow type classes may preclude thinking about social/personal things since their academic nature may require more concentration in the more symbolic and abstract courses.

The affect component should also be considered because social/personal concerns may entail some emotional aspects. Physical education classes were more friendly and sociable and had the highest affect subtotal score. This may be attributable to student happiness, cheerfulness, friendliness, and sociability. If this generalization is valid, physical education classes may have less reason to be concerned with social/personal things.

Low flow type class mean scores were higher than high flow type class mean scores on passive-active, bored-excited (see Table 3), detached-involved (see Table 2), and all affect dimensions except irritable-cheerful (see Table 4). Low flow type classes, because of their traditionally more rigid class structure and socially valuable content, may prevent focusing on concerns outside of class.

Thinking about things outside school

Low flow type class students reported the highest percentage (28%;*f*=449) of responses on the dimension thinking about things outside school. Twenty-seven percent of high flow type (*f*=53) class responses and 23% (*f*=19) reported thinking about things outside school. This similarity in percentages may indicate that students, regardless of class type, are distracted similarly to thoughts outside class. This may be especially true when one considers the social nature and varied extra-curricular concerns of adolescents.

Thinking about classwork

Physical education students had the highest percentage (59%;*f*=34) of responses on the dimension thinking about classwork. High flow type class students had the lowest percentage (38%) of responses indicating they were thinking less about their classwork. Fifty-four percent of low flow type class students indicated they were thinking about classwork when alerted (see Table 6).

There may be several factors contributing to the difference in responses in high flow and physical education classes on this dimension. When the numerical mean scores for the dimensions concentration (see Table 1), detached-involved, wish doing something

else (see Table 2), alert-drowsy, passive-active as well as bored-excited (see Table 3) were examined, it was found that physical education classes had the highest means. Perhaps this indicates that these students were thinking about their classes more than were high flow type class students. Low flow classes had the highest mean scores on ease of concentration, while physical education classes were highest in the extent of concentration dimension. The more academic courses may demand concentration because of their rigid and socially valuable nature. Physical education classes, however, may provide for more extensive concentration because of the sustained attention required for involvement in a physical activity, or possibly due to the competitive element. Enjoyment and social interaction in physical education may also foster more attentiveness to class activities.

The difference between high flow and low flow type class responses on the dimension thinking about classwork may reflect several possibilities. When the mean scores for the cognitive efficiency components as well as the elements detached-involved, wish doing something else, alert-drowsy, passive-active, bored-excited, and sad-happy were examined, several interesting factors emerged. With the exception of the

dimensions wish doing something else and self-consciousness low flow type classes had the highest means. Each of these dimensions may be some indication as to whether students were thinking about their classwork in traditionally more structured and academically oriented classroom settings. The student's attention to work could be an indication of the value of structure in low flow type classes, and added structure to high flow and/or physical education classes may perhaps enhance attentiveness to classwork.

Thinking about another class

Low flow type class students reported the highest percentage (4%;*f*=75) of responses on this dimension while high flow type (*f*=6) class students reported 3% No physical education students indicated that they were thinking about another class.

No comment

Three percent (*f*=1) of physical education student responses indicated no comment while no students reported a no comment response in high flow or low flow type classes.

Summary of Findings of Thought Dimensions

The highest percentage of responses in each class (PE=59%; *f*=34) (LF=54%; *f*=885) (HF=38%; *f*=56) indicated that students were thinking about classwork

when alerted. All classes reported the lowest percentage (PE=0%; f=0) (LF=4%; f=75) (HF=3%; f=6) of responses on the dimension thinking about another class. While students in each class were thinking about social/personal things and to some extent were thinking about things outside school, it is clear that responses indicate that students in all three classes were primarily thinking about things in class.

Student Actions

Group Percentages of Action Dimensions

The investigation of these dimensions was important in that when students responded they were indicating some aspect of their classroom activity. This was important in that it may indicate what students are doing and to some degree their involvement in their present class.

Table 7 shows that high flow type class students reported the highest percentage (30%; f=65) of responses on the dimension doing social/personal things. Physical education classes indicated the highest percentage (90%;f=75) of responses on the doing classwork dimension. Five percent (f=6) of high flow type class responses indicated they were doing another class's work and 4% of responses of low flow type (f=64) and high flow type (f=4) classes indicated they were doing nothing.

Table 7

Percentage of Responses of Action Dimensions

		PE	Low Flow	High Flow
		f=39	f=1608	f=263
Doing Social/Personal Things	%	10	20	30
	f	13	331	65
Doing Classwork	%	90	72	61
	f	75	1158	108
Doing Another Class's Work	%	00	04	05
	f	0	59	6
Doing Nothing	%	00	04	04
	f	0	64	11

Discussion of Frequency and Percentage of Response of Action Dimension

Doing social/personal things

Table 7 indicates that 30% (f=65) of high flow type class responses indicated they were doing social/personal things while 10% of physical education responses (f=13) indicated this. High flow type class students were not involved (see Table 2) and were bored (see Table 3). This lack of attentiveness to class may have provided the incentive to be doing social/personal things.

To a certain degree, some dimensions of affect may reflect one's likelihood to be doing social/personal things. The extent to which one's mean scores reflect friendliness, sociableness, and indicate activation may reflect the extent to which one has been doing social/personal activities. Physical education numerical mean scores were high on each of these dimensions, while high flow type classes were low on friendliness and low flow type classes low on the sociable dimension. The more informal nature of physical education classes may lend themselves to a friendly and sociable atmosphere.

Doing classwork

All three types of classes had the highest percentage (PE=90%; f=75) (LF=72%; f=1158)

(HF=61%; f=108) of student responses indicating they were doing classwork. Students were primarily doing classwork when alerted.

The differences in percentages of responses may be attributed to several factors. The dimensions of concentration, confused-clear, detached-involved, bored-excited, challenge and skill may important on the dimension doing classwork.

When considering physical education and high flow classes, physical education had the highest mean score in each instance above, an indication that in physical education classes, more so than high flow or low flow type classes, students were doing their classwork. The prevalence of higher mean scores in physical education classes may have been related to the nature of the class. This may be true in that physical education classes are generally considered to be developed around a basis of play and games, are more socializing, less riddly structured as well as more physical and particiapatory in nature.

Doing another class's work

A very small percentage (PE=0%; f=0) (LF=4%; f=59) (HF=5%; f=6) of student responses indicated students were doing another class's work. The fact that all students felt relatively happy in

their class (see Table 4) may have contributed somewhat to the fact that few responses indicated students were doing another class's work.

Doing nothing

A small percentage (PE=0%; f=0) (LF=4%; f=64) (HF=4%; f=11) of student responses indicated that students were doing nothing.

Summary of Findings of Action Dimensions

The highest percentage of student responses (PE=90%; f=75) (LF=72%; f=1158) (HF=61%; f=108) indicating that students were doing classwork when alerted. All classes reported low percentages of responses on the dimensions doing another class's work and doing nothing. Some students reported doing social/personal things although most students reported doing classwork.

Summary of Findings of Question 2

There appear not to be any differences among physical education, low flow, and high flow type classes on the dimensions thought and action. The indications are that all three classes were thinking about social/personal things to some extent and that each class was thinking about things outside class to a comparable extent. Few students in either class indicated they thinking about other classes. Each class was thinking

about current classwork to the greatest extent.

As with the thought dimensions there were few differences on the action dimensions. The indications are that all three classes were doing some social/personal things and that few students in either class were doing another class's work or doing nothing when alerted. Primarily students in all three class types were doing classwork when alerted. Table 7 indicates these findings.

Question 3:

> Are there any differences among physical education, high flow, and low flow type classes on frequency of flow (C=S).

The frequency of flow in physical education, high flow, and low flow type classes was investigated within the framework of question 3. The occurrence of flow (C=S) was investigated in three types of secondary school classes. At the alert students in each class indicated the extent (0-9) of challenge and skill they were experiencing. The response frequencies are representative of the incidence of flow as indicated on Response Sheets. Data were examined for incidence and percentage of occurrence of flow and treated descriptively. These data are presented in Tables 8 and 9.

Table 8

Percentage and Frequency Of Flow In Physical Education, High Flow, And Low Flow Type Classes

		TYPE OF CLASS			
		PE	HIGH FLOW	LOW FLOW	Total f
EXISTENCE OF FLOW	FLOW	f=15 38%	f=83 32%	f=401 25%	499
	NO FLOW	f=24 62%	f=180 68%	f=1207 75%	1412
	Total f	39	263	1608	1910

TABLE 9

Percentage And Frequency Of Flow, Anxiety, And Boredom In Physical Education, High Flow, And Low Flow Type Classes

TYPE OF EXPERIENCE	TYPE OF CLASS PE	HIGH FLOW	LOW FLOW	Total f
ANXIETY (C>S)	21% f=8	24% f=64	28% f=455	.527
FLOW (C=S)	38% f=15	32% f=83	25% f=401	.499
BOREDOM (C<S)	41% f=16	44% f=116	47% f=752	.884
Total f	100% 39	100% 263	100% 1608	1910

C=Challenges

S=Skills

Incidence of Flow, Anxiety, and Boredom Among Students In Physical Education, High Flow, and Low Flow Type Classes

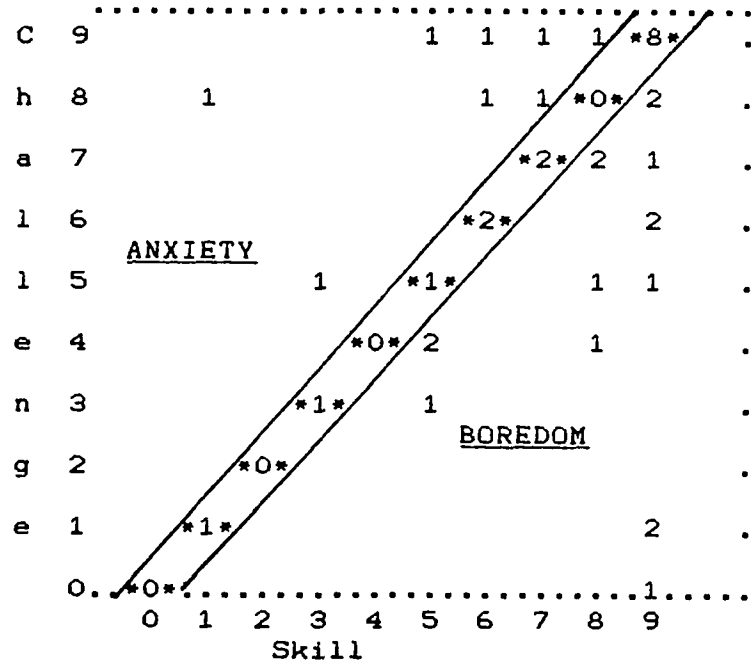
Among 39 physical education responses 15 (38%) indicated flow. Among the remaining 62% (f=24) of the Response Sheets 21% (f=8) students reported anxiety and 41% (f=16) indicated boredom. These results are presented in Table 9.

In the percentage of occurrance of anxiety, flow, and boredom, each class indicated the highest percentage of responses in the boredom category. Physical education classes reported the highest (38%) percentage of flow responses. Low flow type classes had the lowest percentage (25%) of flow responses as well as the highest percentage (28%) of anxiety. High flow (44%) and low flow type classes (47%) indicated the highest percentage of boredom responses among the three types of classes.

Incidence of flow and distribution of skill-challenge responses in physical education classes

Physical education students experienced flow at varying levels, shown on the skill-challenge scale in Figure 4, from a low of 1,1 to a high of 9,9. Among the 15 physical education incidents of flow, 8 (53%) of this number occurred at the 9,9 level. See Figure 4 for

Figure 4
Incidence of Flow and Distribution of Skill-Challenge Responses in Physical Education Classes



Incidence

FLOW f=15

ANXIETY f=8

BOREDOM f=16

Total Physical Education Responses f=39

these data.

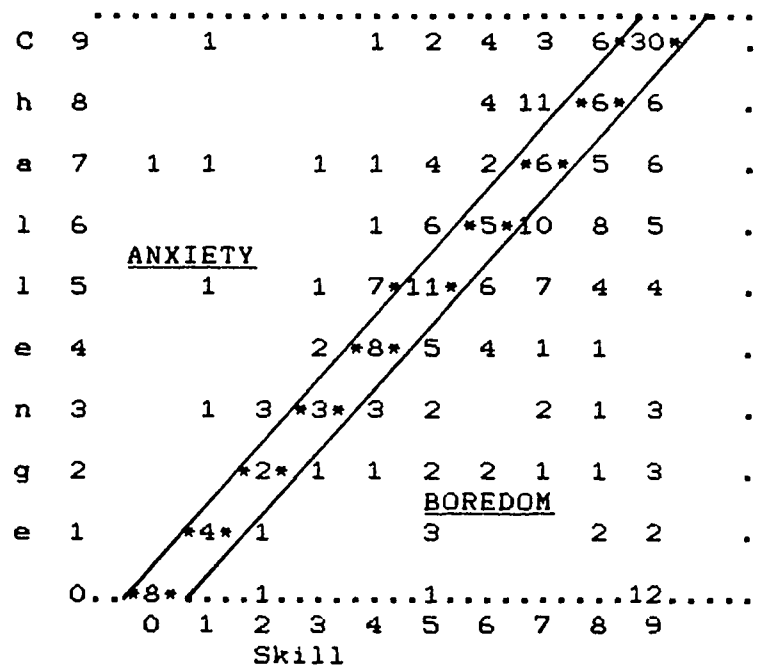
Of the remaining 24 (62%) physical education responses not indicating flow, Figure 4 shows that 8 responses were either just above the flow channel in the anxiety quadrant (f=2), or just below the flow channel in the boredom quadrant (f=6). This indicates a total of 23 incidences (59%), either in flow or near the flow channel. This slight variance from the flow channel may represent an increased opportunity for these students, were the environment altered, to experience flow in physical education. Figure 4 shows that among the remaining 16 incidents (41%), 10 represented boredom at various levels, while 6 were indicative of a state of anxiety.

Incidence of flow and distribution of skill-challenge responses in high flow type classes

Table 9 shows that among 263 student responses in high flow type classes, 83 (32%) responses indicated flow. Low flow type classes had the highest percentage (47%) (f=752) of its responses in the boredom category. The lowest percentage of (24%) (f=64) high flow class responses was in the anxiety classification.

Figure 5 indicates that students in high flow type classes experienced flow at levels ranging from 0,0 (8 or 3% of 263) to 9,9 (30, or 11% of 263). Among the

Figure 5
Incidence of Flow and Distribution of Skill-Challenge Responses in High Flow Classes



Incidence
FLOW f=83

ANXIETY f=64

BOREDOM f=116

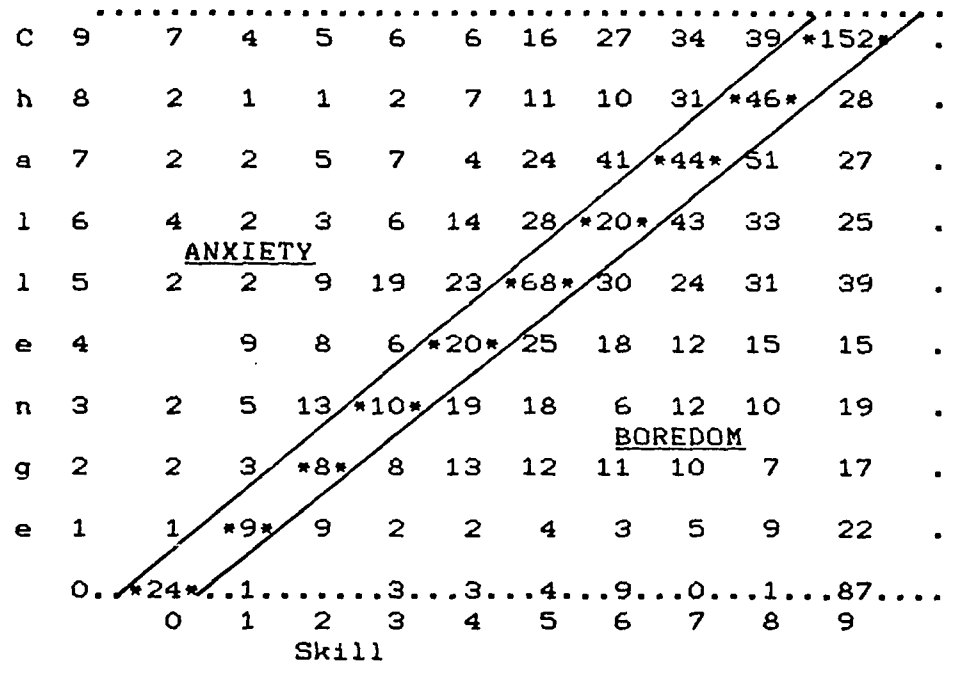
Total High Flow Responses f=263

remaining 180 no flow responses, Figure 5 demonstrates that 37 (14%) were just above the flow channel in the anxiety quadrant. The same number of students indicated a response just below the flow channel in the boredom quadrant. In other words, a total of 157 students (60%) were in or near the flow channel. These results could signify that many students in high flow classes in this study were possibly on the verge of experiencing flow. Figure 5 shows nearly twice as many incidents of boredom as anxiety in high flow type classes, indicating that the students perceived themselves to be more skilled than the challenges required.

Incidence of flow and distribution of skill-challenge responses in low flow type classes

A total of 1608 usable responses were submitted in low flow type classes. Table 9 indicates that 401 (25%) incidents of flow occurred within low flow type classes. Low flow type classes reported the highest percentage (47%) (f=752) of all three classes on boredom responses. Low flow type classes also indicated the lowest percentage (25%) (f=401) of flow responses as well as the highest percentage (28%) (f= 455) of anxiety responses of any type class. Figure 6 shows that students in low flow type classes experienced flow at levels from 0,0 (24 or 1% of 1608) to 9,9

Figure 6
Incidence of Flow and Distribution Skill-Challenge Responses in Low Flow Classes



Incidence
FLOW f=401

ANXIETY f=455

BOREDOM f=752

Total Low Flow Reaponaea f=1608

(152, or 9% of 1608). Of the remaining 1207 responses indicating no flow, 185 (12%) were near the flow channel in the anxiety quadrant. Two hundred fourteen incidents (13%) were near the flow channel in the boredom quadrant. Figure 6 indicates a total of 800 (49.75%) incidents at flow or near the flow channel.

Discussion

Differences in the incidence of flow (C=S) were found among physical education, high flow and low flow type classes. Thirty-eight percent (f=15) of physical education responses indicated flow. Thirty-two percent (f=83) of high flow responses signified flow. Twenty-eight percent (f=455) of low flow responses indicated flow (see Table 9).

The lowest number (15) but highest percentage (38%) of flow responses were in physical education classes (see Table 8). Physical education classes had the highest percentage (53%) and the lowest number (8) experiencing flow at the highest level (9,9) (see Figure 4). This may not only indicate the prevalence of flow in physical education classes but in some ways the quality of flow. The physical and sometimes outwardly competitive nature of class content may be a reason for the prevalence of flow. These factors may facilitate flow, as Csikszentmihalyi (1975) contends, as well as

possibly accounting for the highest levels of flow.

In all three class types at least 49.75% of the responses were in or near flow. These results suggest that if classroom environments and teaching methods were altered, even slightly, or students better understood how to recognize and explore challenges in a positive manner, the incidence of flow might rise because half of the experiences were non-flow, leaving plenty of room for expansion of more flow. The results also indicate that flow is present at moderate levels in these types of classes.

Low flow type class responses indicated the highest levels of anxiety (28%) and boredom (47%), though in all three types of classes at least 41% of the students were bored (see Table 9). These figures demonstrate that 1411 out of 1910 (74%) responses indicated boredom. At these times the students were probably not being challenged. They possibly felt more skilled than the challenges of the material being offered.

Perhaps students need to understand how to recognize challenges and how to appropriately respond to them. Teachers may be dwelling too long upon the same material using the same methods, even though student performance may indicate a need to do so. Teachers may need to

consider new and more interesting presentations of material and methods to allow for progression at a student's individual pace.

With the exception of low flow type classes, anxiety appeared least prevalent among the three class types. Low flow type classes exhibited the highest percentage (28%) as well as the highest response frequency (*f*=455) experiencing anxiety. Although anxiety is certainly present, boredom appears to be the mainstay in each class. Boredom may present itself in low flow classes because of the repetition, rote memorization, practice, and tedium sometimes associated with more academic classes. Some of this boredom might be alleviated by trying new teaching methods and concepts or even by having teachers pursue the newest advances in their subject area. It may also be beneficial to offer students a general course on how to deal effectively with challenges. A challenged teacher and student may become happier, more productive persons.

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

The purpose of this inquiry was to investigate the presence of challenge and skills in three types of classes which may result in flow and to investigate the feelings, thoughts, and actions of students in these classes. A summary of the findings, implications, conclusions, and recommendations for further research follow.

A 21-item Response Sheet was employed to collect data from 310 secondary school students each day in each class for two non-consecutive days. The three class types investigated included physical education, high flow (e.g., art, music, shop,), and low flow, traditionally academic classes (e.g. mathmatics, English,). The intent was to examine the occurance of flow, as well as the thoughts, actions, and certain feelings of students, as they were alerted. Data were collected the week of April 7-11, 1986.

Once data were collected, Response Sheet dimensions were categorized into their original components of

cognitive efficiency, motivation, activation, affect, as well as challenge, skills, thoughts, and actions. Four dimensions comprised each primary component, and a subtotal score was derived from each component. The thought and action questions were open ended and upon collection were divided into five categories on the thought responses and four categories on the action responses. Data were treated descriptively to determine differences in means and standard deviations among the three class types on the dimensions comprising cognitive efficiency, motivation, activation, and affect as well as skills and challenges.

Findings

Primary Components

Cognitive Efficiency

Differences emerged among class means on each dimension in the cognitive efficiency component. Though students in physical education classes concentrated most extensively, they had the most difficulty concentrating. Each class type indicated some self-consciousness, while those in physical education classes demonstrated high levels of clarity (see Table 1).

Perhaps these findings have implications for other classes. If some of the characteristics

associated with physical education classes, including the social aspects, and increased physical interaction were incorporated into into other class types, perhaps these classes would increase their cognitive efficiency capabilities. The less rigid structuring associated with physical education classes as well as the play and game orientation may also enhance low flow and high flow type classes if incorporated to some extent.

Motivation

Differences were determined among class means on all 4 dimensions of the motivation component. Students in physical education classes felt most in control of their actions, were most involved, felt freer, and wished to be doing something else least (see Table 2).

Perhaps the nature and less rigid structure of physical education class is related to the higher means for physical education on this component. It is possible that the play and game nature of physical education classes influenced students' minimal wish to be doing something else.

Activation

Differences among class means were indicated on each dimension. Physical education students were more alert, felt more active, felt stronger, and indicated

more excitement in their classes (see Table 3).

These findings seem natural for a class whose basis is in physical activity. Perhaps if more participatory and physical elements as well as a more social and less rigidly structure were incorporated into high flow and low flow type classes students in these classes would become more excited, alert and less passive.

Affect

Differences were found among class means on each dimension. Physical education students had the highest mean scores on each dimension (see Table 4).

These findings may imply that the nature of the class may influence how students feel in the class. Since students in physical education felt most cheerful, were happiest, felt friendliest, and most sociable, the class structure may have been a factor in the outcome of student affect perceptions. The less rigid structure, more game and play orientation as well as the more socialcharacteristics of the class may have enhanced positive affect scores. The physical and participatory elements associated with the play and game nature may also have contributed to the positive affect.

Challenge and Skill

Differences were found among the means on the challenge and skill dimensions. Physical education class means were highest on both dimensions.

Challenge

Students in physical education classes were most challenged. Perhaps this was due to the more physical, participatory nature of the class. Physical education classes are also play and game oriented and may involve competition. Competition may encompass challenge which may partially account for the extent of challenge indicated by physical education students.

Skill

Students in physical education classes felt more skilled than those in low flow or high flow type classes. Perhaps the play and game characteristics as well as the physical and participatory nature of physical education class accounted for the reported levels of skill.

The level of challenge (see Table 5) occurring in physical education classes may reflect competitive elements sometimes associated with the play and game nature of these classes. However, the skill level in physical education classes indicated that students may not have been threatened by the challenges provided in these classes.

Thoughts and Actions

Responses on the thought/action dimensions were categorized into five groups indicating student thoughts and four groups indicating student actions. Tables 6 and 7 summarize these groups.

Thoughts

Some differences were determined among the three class types on the frequency of occurrence and percentage of response. Responses in all three classes indicated that students were primarily thinking about present classwork, though there was some indication that students were thinking about social/personal things and things outside school. Very few responses indicated students were thinking about another class (see Table 6).

Students in physical education classes were involved and interested enough to be thinking about present classwork. Perhaps this is due to to the nature of its play and game orientation, the less rigid structure and the socializing nature of the class. The physical, participatory elements may have been factors in the extent of student thoughts about classwork.

Actions

Consistent with the thought dimensions, action dimension responses showed that students to the greatest extent were doing classwork. To a much lesser extent

(see Table 7) students were doing social/personal things, while very few indicated doing another class's work and even fewer reported doing nothing.

Perhaps the physical, participatory nature partially accounted for the extent of students doing classwork in physical education classes. This same factor may have contributed to the low incidence of doing social/personal things and doing other things in class.

Incidence of Flow

The occurrence of flow (C=S) was compared in the three class types and treated descriptively. The incidence of flow was determined by the student responses on the dimensions challenge and skill. A difference was apparent in physical education, high flow and low flow classes on the occurrence of flow. Table 8 indicates the high incidence of no flow regardless of class type.

Physical education classes had the highest percentage (38%) of flow (C=S). Low flow type classes had the lowest percentage (25%) of flow. Low flow type classes were most anxious (C>S) (f=455) (28%) and most bored (C<S) (f=752) (47%). The greatest percentage and number of students in each type of class were bored (PE, 41%, f=16), (High Flow, 44%, f=116),

(Low Flow, 47%, f=752). Table 9 indicates these data.

Fifty-three percent (f=8) of the incidence of flow in physical education classes occurred at the highest level (9,9). Eleven percent (f=30) of the incidence of flow in high flow classes and nine percent (f=152) in low flow type classes occurred at the highest level (9,9).

The distribution of the skill-challenge responses showed that of those responses not indicating flow, a remarkable number may have been on the verge of flow. A total of 59% (f=23) of physical education responses were either at flow or one level above or below the flow channel Figure 4 indicates these responses. Sixty percent (f=157) of the responses in high flow classes were either at flow or within one level above or below the flow channel (see Figure 5). In low flow classes 49.75% (f=800) of the responses were at flow or within one level of the flow channel (see Figure 6).

Conclusions

Within the limitations of this investigation the following conclusions, based upon data collected and analyzed, are offered. These conclusions are delineated according to the questions set forth in the problem statement.

Question 1:

> Are the any differences among physical education, high flow, and low flow type curriculum classes on the dimensions comprising the components of cognitive efficiency, motivation, activation, and affect, as well as challenge and skill.

With the exception of the dimensions "ease of concentration," means reported for physical education classes were the highest. Perhaps the physical, participatory and social nature of physical education partially accounted for higher means on these dimensions. It is also possible that the game and play characteristics of physical education as well as the less rigidly structured nature of physical education classes contributed to the higher means.

Cognitive Efficiency

Students in physical education classes seemed to concentrate at higher levels, while low flow type classes concentrated with the most ease. Low flow type classes were the most self-conscious, while clarity was highest in physical education classes.

Motivation

Physical education classes indicated a greater degree of involvement than high flow type classes and reported more freedom than either high flow or low flow classes. Physical education classes wanted most to be doing what they were doing.

Activation

Low flow type classes reported that they were more active than high flow type classes. Physical education classes indicated that they were more alert, active, and excited than high flow or low flow type classes.

Affect

Physical education classes exhibited more friendliness than either high flow or low flow type classes and were more sociable than low flow type classes.

Question 2:

Are the any difference among physical education, high flow, and low flow type curriculum classes on the dimensions of thought and action.

Thought

Among five categories regarding student thoughts when alerted, differences were found among means on the class types (see Table 6). Students in all three classes were thinking most about classwork though physical education students indicated the highest percentage response level. To a lesser extent students in each class were thinking about social/personal things.

Action

Among four categories in the action dimension, there were differences among means in all three

class types (see Table 7). Though students in all three class types reported a high percentage of responses indicating they were doing classwork, physical education students did so to the greatest extent. To a lesser extent students in each class were doing social/personal things.

Question 3:

> Are there any differences among physical education, high flow, and low flow type classes on the frequency of flow (C=S).

Occurrence of Flow

A difference emerged between physical education, high flow and low flow type classes in the occurrence of flow with physical education classes having the highest incidence of flow. A high incidence of no flow was exhibited in each class type (PE=62%, LF=75%, HF=68%).

Implications

Something seemed to be occurring in physical education classes which resulted in students having a higher mean on most of the dimensions comprising the components of cognitive efficiency, motivation, activation, affect, and challenge and skills. Further study may provide more insight into these areas.

It is possible that the difference in nature of the classes influenced the higher mean scores. Perhaps the more social, less rigid structure and more game and

play oriented nature of the class was a contributing factor. The naturally physical and participatory nature of the classes may also have influenced the outcome of scores.

Flow does occur in all three types of classes though not with much frequency, as Table 8 shows. An obvious explanation why students were not experiencing flow is that they were bored, as Table 9 indicates. This suggests perhaps there are elements, such as the level of challenge, which may contribute to the regulation of flow in the classroom. It may also be plausible to encourage a better student understanding of what a challenge is, how to constructively meet challenges, and how one may grow from meeting challenges.

It may be possible to enhance flow if teachers and/or students were especially perceptive to the level of challenges currently occurring and increased challenges as one's skills increased. This would require unusual effort on the part of teachers and/or students.

Recommendations For Further Study

(1) It is recommended that secondary athletes and physical education students be investigated to compare flow and feelings.

(2) It is recommended that a similar study be conducted in schools which offer elective and

required physical education.

(3) It is recommended that the response sheet be revised, simplified and administered to a sample of junior high students.

(4) It is recommended that a comparable study be initiated, including additional variables, such as grades, sex, socio-economic status, and so forth.

(5) It is recommended that because this study was carried out in a rural, small school setting, it may be beneficial to investigate and compare a sample of students in a small, rural setting to a sample in a larger, urban educational setting.

(6) It is recommended that a study be done to compared the occurrence of flow in teachers and students.

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Appendix A: Response Sheet

Response Sheet

Sex: Circle One Male Female

Date:____ Time Alerted:___ am pm Time Filled Out:___

As You Were Alerted:

What were you thinking about?_____

_____

Which class were you in?_____

What was the MAIN thing you were doing?_____

_____

	Not Very Well									Very Well
	0	1	2	3	4	5	6	7	8	9
How well were you concentrating?	+	+	+	+	+	+	+	+	+	+
Was it hard for you to concentrate?	+	+	+	+	+	+	+	+	+	+
How self-conscious were you?	+	+	+	+	+	+	+	+	+	+
Were you in control of your actions?	+	+	+	+	+	+	+	+	+	+

Describe your mood as you were alerted:

	very +3	quite +2	some +1	neither 0	some -1	quite -2	very -3	
alert	+++	++	+	–	+	++	+++	drowsy
sad	+++	++	+	–	+	++	+++	happy
cheerful	+++	++	+	–	+	++	+++	irritable
weak	+++	++	+	–	+	++	+++	strong
friendly	+++	++	+	–	+	++	+++	angry
passive	+++	++	+	–	+	++	+++	active
sociable	+++	++	+	–	+	++	+++	lonely
detached	+++	++	+	–	+	++	+++	involved
free	+++	++	+	–	+	++	+++	constrained
bored	+++	++	+	–	+	++	+++	excited
clear	+++	++	+	–	+	++	+++	confused

	0	1	2	3	4	5	6	7	8	9
	low									high
Challenges of the activity	+	+	+	+	+	+	+	+	+	+
	low									high
Your skills in the activity	+	+	+	+	+	+	+	+	+	+
	not at all									very much
Do you wish you had been doing something else?	+	+	+	+	+	+	+	+	+	+

****

Great thoughts, excuses, etc...(use back if necessary)

Appendix B: Human Subjects Procedures Form

Human Subjects Procedures Form

The University of North Carolina
at Greensboro
School of Health, Physical
Education, Recreation & Dance
Greensboro, North Carolina 27412

3/27/96
Date

To: G.L. Chandler :

The purpose of this communication is to indicate the results of the review made by the Human Subjects Committee of your proposed project

The Perceived Balance ... Curriculum

The evaluators have judged your plans which guarantee the rights of human subjects to be

☐ Approved as proposed

☒ Approved conditionally pending
- must get informed consent from all parents of students under 18 yrs. of age. If principal agrees in writing that the data you want to collect is part of the school curriculum - you do not need informed consent from parents.

☐ Not approved. Please contact the School Human Subject Chair, for further information.

We appreciate your compliance with School/University regulations in this important matter. Please remember your commitment to notify the Committee in the event of any change(s) in your procedure.

Sincerely,

WB Kaye

Chair, School of HPERD
Human Subjects Review Committee

Revised 12/93

Appendix C: Consent Letter, Informed Consent Form

Consent Letter

Teachers:

Thank you for your cooperation. The message immediately below is regarding the enclosed informed consent sheet. Please have your students read the informed consent sheet. After reading this consent form please ask any students who are willing to participate in the study to sign their name and date at the bottom of this page and turn these sheets back in to you immediately during this homeroom period. By signing each student agrees to participate in this study. Teachers may fill out informed consent sheets at the same time students in their class do.

Teachers, please read the following message to your students: THE MESSAGE IS: Your cooperation will be appreciated in filling out the response sheet which you saw at Wednesday's assembly at certain times during the week of April 7-11. When you are alerted over the public address system you will need to print the date and the time of day. Then you will need only to answer the first four questions in your OWN WORDS. The other responses will require you circle the number which indicates how you feel at that particular time. These response sheets will be passed out to you in classes during the above mentioned week for your responses. Certain students will be asked to distribute and collect these sheets. Thank you ALL for your cooperation.

Sincerely,

Gary Chandler

INFORMED CONSENT*

I understand that the purpose of this study is to gain better knowledge of the feelings and attitudes of adolescent secondary school students.

I confirm that my participation in this study is entirely voluntary. No coercion has been used to obtain my cooperation.

I understand that I may withdraw my consent and terminate my participation at any time during the project.

I have been informed of the procedures that will be used in these class observations and understand what will be required of me.

I understand that all of my written and oral responses will remain completely anonymous.

I understand that a summary of the RESULTS of these observations will be made available to Mr. Rogers Ford, Principal, Rivercrest High School, for the use of students and teachers.

I wish to give my voluntary cooperation.

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Teacher Signature Date

*Adapted from L.F. Locke and W.W. Spirduso. Proposals that work. New York: Teachers College, Columbia University, 1976, p. 237.