

Are Physical Education Classes Encouraging Students to be Physically Active?: Experiences of Ninth Graders in their Last Semester of Required Physical Education

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Abstract

Rhetoric in physical education literature suggests students should benefit from physical activity and learn how to attain moderate or vigorous levels of engagement (Centers for Disease Control, 1992,1996). To date no one has asked students if their physical education experience has helped or hindered participation in regular physical activity. This study interviewed forty-six ninth graders (26 high skilled, 20 low skilled) about their physical education experience and their anticipation of future engagement in organized physical activity. Six themes were identified, three were common to all irrespective of skill level and three were different by skill level or between boys and girls. Implications for physical educators are discussed.

Introduction

The new rhetoric in physical education suggests students should learn the benefits of physical activity and how to attain moderate and vigorous levels of engagement (Centers for Disease Control, 1992; Centers for Disease Control, 1996; U.S. Department of Health and Human Services, 1996). Regular engagement in moderate to vigorous amounts of physical activity contributes to several long term health benefits, notably decreased risk of heart disease, high blood pressure, certain types of cancer, and diabetes. Sadly, data indicates that fewer than one in four children get

20 minutes of vigorous activity every day and that less than one in four reported getting at least half an hour of any type of physical activity every day (National Association for Sport and Physical Education, 1997).

As early as 1977, Greendorfer suggested the strongest predictor of adult participation was childhood involvement. Her findings support those of the 1996 survey (U.S. Department of Health and Human Services) which indicated that the strongest predictor of physically active children were physically active adults. Parents who were physically active or played sports with their children, who watched their children participate in physical activities, or who took their children to physical activities or sports events had more physically active children (National Association of Sport and Physical Education, 1997).

In addition to parents, studies in physical education have identified five other variables (friends, teacher, parents, curriculum, success and failure, and gender) which influence the experiences of students in physical education (e.g., Aicinena, 1991; Carlson, 1995; Duncan, 1993; Figley, 1985; Griffin, 1984, 1985; Hutchinson, 1993; Lee, Carter, & Xiang, 1995; Patterson & Faucette, 1990a, 1990b; Portman, 1995a, 1995b; Sanders & Graham, 1995; Tannehill, Romer, O'Sullivan, England, & Rosenberg, 1994; Walling & Duda, 1995). How students experience physical education classes could influence their

attitude about physical activity that may or may not be reflected in their physical education class behavior. To date, no one has asked students if their physical education experiences have helped or hindered participation in regular physical activity.

The purpose of this study was to examine the experiences of ninth graders in their last semester of required physical education. Two research questions were identified in advance. The first question was: What were the physical education experiences of these ninth graders? The second question was: Once their requirement in physical education was completed, does their immediate future include any regular physical activity?

Literature

The Surgeon General's Report on Physical Activity and Health (U.S. Department of Health and Human Services, 1996) concluded that Americans can substantially improve their health and their quality of life by participating in moderate, regular amounts of physical activity. Among the effects of physical activity were lower mortality rates, decreases in cardiovascular disease, high blood pressure, colon cancer, and helped lower the risk of developing diabetes. In addition, regular physical activity was associated with achieving and maintaining bone mass, reduction of obesity, relieving depression, anxiety and improving mood, and maintaining normal muscle strength, joint structure, and joint function (Blair & Morrow, 1997; Hooper & Leoni, 1996; U.S. Department of Health and Human Services, 1996; Wells, 1996). Regular participation in physical activity has been recognized as essential to the normal development in children (American College of Sports Medicine, 1988) and promotion of physical activity in children and adults has become a national health goal. Sallis & Patrick (1994) reported an expert panel's recommendation that adolescent youth accumulate at least 30 minutes of moderate-intensity physical activity

daily or complete at least three sessions of continuous moderate-to-vigorous exercise weekly.

Sadly, national surveys have indicated that few adolescents are meeting this minimal goal (Centers for Disease Control and Prevention, 1992; Centers for Disease Control and Prevention, 1996, U.S. Department of Health and Human Services, 1996), with as many as 51% of boys and 76% of girls failing to meet these goals (Heath, Pratt, Warren, & Kann, 1994). The Surgeon General's Report (U.S. Department of Health and Human Services, 1996) concluded that approximately one-fourth of adolescents participated in no-vigorous activity, about one-half regularly participated in vigorous activity, and participation in all types of physical activity declined as age or grade in school increased. The 1996 survey conducted for the International Life Sciences Institute reported that fewer than one in four children have 20 minutes of vigorous activity every day and less than one in four reported getting at least 30 minutes of any type of physical activity every day (National Association for Sport and Physical Education, 1997).

Opportunities to participate in athletics and youth sports have increased allowing more children to engage in outside physical activity. In schools, however, physical education remains the only class which students receive throughout their education years that is responsible for addressing and assessing physical activity. Whereas physical education classes should be fun, enjoyable, a time to learn skills and play games (McKenzie, Alcaraz, & Sallis, 1994), the classes, also, should allow students to learn the benefits of physical activity and how to attain moderate and vigorous levels of engagement (Centers for Disease Control, 1996; U.S. Department of Health and Human Services, 1996). Data from some studies suggest that for some children physical education class is not fun, is intimidating and unsafe (Carlson, 1995; Portman, 1995a), that students have devised several strategies to avoid opportunities for physical engagement (Hopple &

Graham, 1995), and that many current programs fail to have a positive impact on students with respect to healthy living (Tannehill & Zakrajsek, 1993; Tinning & Fitzclarence, 1992).

For example, third graders in Hopple & Graham's study (1995) were asked for their impressions of the mile-run test. The authors found that students did not have a clear understanding of why they took the test and that several developed "test dodging" skills to avoid the mile run (p. 413), including faking a variety of illnesses, being absent, or producing a written note from a doctor or parent.

The low-skilled sixth graders (Portman, 1995a, 1995b), the alienated high school students (Carlson, 1995), and the Australian secondary students (Tinning & Fitzclarence 1992) thought physical education should be fun, safe from harassment, and a class within which they should be successful. Their experiences of physical education, largely, were negative and they, too, developed several coping strategies (e.g., compliance or absenting themselves from the class). The conclusion of some lesser skilled girls was that physical education class would be safer if separated by gender (Portman, 1995a, 1995b). These girls resented being taunted and ridiculed by the boys in the class, especially those boys with medium skill: they felt the teacher had not done enough to stop their harassment.

Although individual physical education programs have modified their curriculum to introduce different models (e.g., cooperative, fitness, and sport education), the majority of students continue to participate in a multi-activity (largely games playing) program. As lifelong practices of physical activity begin in school age years, asking students in a multi-activity program about physical education's relationship to physical activity is important.

Method

Seven 9th grade classes from 3 different high schools in northeastern Indiana were selected to

participate in this study. Ninth graders were selected because they were in their last semester of required physical education.

The schools were selected on the basis of access and their geographical proximity to the university. Permission from district administrators, the individual school principals, and the physical education teacher was secured. The physical education teachers whose classes would be observed signed informed-consent documents. The 4 teachers ranged in teaching time from 1 to 26 years (the average was 14 years), three were male, and none had any direct contact with the researcher prior to the study. Informed consent forms, also, were signed by the parents/guardians of each student in the selected classes.

Students were asked to participate in the study if the teacher's rating of their skill matched student performance on a skill test as either high skilled or low skilled. First, the teachers were asked to assign the students into three skill levels of predicted skill performance (high, medium, low) prior to each unit observed.

Second, a skill test, measuring a desired skill outcome, was given on the first day of the unit. A product and process checklist was developed by the researcher to be used. Skills that were tested included serving in badminton, sprinting in track, the lay-up in basketball, and dribbling in soccer. Those students who were ranked either high- or low-skilled and who placed in that category on the skills tests were asked to participate in this study.

In all, 46 students in 7 different physical education classes attending 3 different schools were interviewed. Girls (n=25) slightly outnumbered the boys (n=21). Twenty six students were high skilled (HSS) and 20 students were low skilled (LSS). Among the HSS, boys outnumbered girls (18 to 8); 19 of which (14 boys/5 girls) were involved in after school athletics. Of the LSS, 17 were girls. None of the LSS were involved in any after school sport. In general, teachers identified more boys as HSS (n=29) and more girls (n=24) as LSS and tended

to use the same skill ranking for the students regardless of the unit.

Data Collection

Interviews, both formal and informal, were used to gather the data. Each student was individually interviewed for approximately 40 minutes. The interviews began some questions designed to stimulate conversation (e.g., What are some activities you do in your gym class?). The interviews were held outside of the physical education classes, either during study period or lunch, and took place in a neutral room away from the gymnasium. All interviews were tape recorded and later transcribed.

Analysis of Data

Lincoln and Guba (1985) have described qualitative methodology for analysis of interview data. In this study descriptive information was obtained from the interviews and observations. The information was analyzed in three stages: sorting and display of raw data, production of intermediate products, and description and explanation of themes.

First, the interviews were transcribed from tapes to typewritten text. Second, the interview transcripts were grouped into sets of similar categories. Finally, the total was inspected for the presence of behaviors that were common to all or most of the students in the observed physical education classes. Throughout the study, analysis was assisted by peer debriefers who challenged the categories and helped in formulating additional research questions.

Results

Themes are composite stories about the experiences of many students. They are not simply compilations of answers to direct questions asked during the interviews, nor are they comprised exclusively of information from

one student. They emerge from the interviews and are used to describe and interpret student voices. In this study, some experiences were common to all the students irrespective of skill level, "Gym is fun when I can do it," "I don't like what I can't do," and "Gym is best when I can be with my friends". Other experiences were different by skill level groups or between girls and boys. These themes are identified as "Separate is better," "I will probably be a couch potato," and "Why try?."

"Gym is fun when I can do it."

All students agreed that they liked physical education classes better when they were successful. Students associated success with having fun and enjoyment. How success was defined varied among the students. For most, success meant doing an activity or specific skill that they already knew how to do. For example, Amanda (HSS) said:

I really like class when we are playing basketball. I am kind of good at basketball and I think it is fun. I can catch it and shoot it sometimes but I can't like dunk it. I learned it from my older brothers. They play it all the time. We have a hoop on the back of the garage so we can play anytime.

or Susan (LSS) explained:

I like it when we are swimming because I can do it. I have been swimming for a long time and I like it. At first, my daddy taught me then later he put me in lessons. And then I would swim almost every day.

Liking what they already could do because they were already successful explains why students continued to like some activities played within class or favor other activities not currently offered. For example, Beatrice wanted longer hockey units, Tony desired adding tennis and extending the badminton unit, and Leslie wanted to play volleyball for most of the school year.

High-skilled students cited many more instances of success that did the low skilled students and thus were more likely to consider the entire physical education experience as worthwhile and good. The LSS named very few instances in which they were, in fact, successful and one young man could not think of a single example in which he had been successful that year. He summed up his feelings by saying, "I am really not good at anything."

"I don't like what I can't do"

All students, irrespective of skill level or gender, agreed that if they were not successful, the activity was not fun and should be dropped from the curricular offerings. High-skilled students, both boys and girls, tended to drop square dancing and football in favor of other team sports or weight lifting, an activity some had been begun in the eighth grade. Nat (HSS) summed up this attitude saying:

I would eliminate square dancing. I would put in a time for physical fitness. How do you get your weight down and how to do certain calisthenics to improve your coordination-stuff like that. We don't do any weight lifting here unless you are in an extracurricular sport.

Low-skilled students named very few times when they were successful. Perhaps because of their high rate of failure, they wanted to change the entire curriculum. Some of their suggestions were dropping team sport, de-emphasizing competition, and increasing skill practice. Brian (LSS) stated: "As long as you don't have to play an actual game. If you could just shoot around and not have rules and relays and stupid things like games, like we always do." And Jennifer (LSS) said: "If I knew how to play basketball it would be better. We play games but not like learn the skills. I don't think I got better in basketball cause we were never taught anything."

Experiences of failure were associated with feelings of personal failure, frustration, and anger. John (LSS) summed up the feelings of some of the low skilled:

I was next to the last place in the walking race. I felt really bad as though I had let the team down or something because I didn't win. I was disappointed in myself not at anybody else. I thought I was going to walk a lot faster but there were a lot of people who were walking a lot faster than I was.

Other low skilled students, on the other hand, pretended not to care. As Ginny (LSS) said, "Who cares, it's just a game anyhow. People take things too seriously."

"Gym is best when I can be with my friends"

All students liked having a friend as a partner or several friends on a team. Boys, with few exceptions picked boys and girls picked girls. All chose partners who were within the same skill level. Friends were viewed as safe—they were not critical of mistakes and students perceived that they did better when they had the option to choose with whom they played.

The high skilled students picked partners that were as competitive as themselves. Several bragged that their team won the class tournaments. As Sophie (HSS) suggested: "I like it when we get to pick the person we are with. If you can pick your friends, well I seem to do better then." Wilma (HSS) said: "In volleyball they divided us by groups of how well you did and I was in the better group and it was fun because people could hit it and you could play a game."

Low-skilled students also liked having friends on their teams or as partners. Their reasons were different from those of the high skilled students. Having friends meant you had someone or many with whom one could commiserate with your playing ability.

Brenda (LSS), for example, liked friends because you had someone to talk to: "Well, it's

okay, gym class that is, because I have a lot of friends in there so you have more time to talk. But it's not okay when there are games and you can't really want to play." While Brain (LSS) stated:

I didn't do well in volleyball. I went to hit the ball and was like the stupidest person in the whole gym class. I went to go hit it and I ended up throwing myself into the net every time. I felt humiliated but at that time we could pick our teams and it was my friends on the team. There were no preps on my side so that made it easier. My team all laughed about it but it wasn't mean or anything like that.

"Separate is better"

None of the observed classes were co-educational. In three classes, girls and boys participated together for roll call and exercises but were separated once the activities started. In the four other classes, boys and girls were in different sections of physical education. Students in all classes did report having co-educational volleyball and square/folk dance units.

The students had very definite ideas about co-educational physical education. In general, the high skilled boys and girl were more open to activities being co-educational, depending on the activities and the configuration of teams, than were the low skilled students. For the high skilled, gender was not as important as skill level. Co-educational classes were okay if the teams were matched by ability. Joseph's (HSS), statement reflected the concern highly skilled students had about mixed ability teams—that they might get paired up with the "losers":

I think gym is boring. The thing that makes it so boring is that sometimes you get people on your team who don't want to be there or if you are playing a game and they would be like blobs on the court. You know, I love playing basketball, just a regular game, when it is officiated. It's not like wild every

day like it is in our gym class. In class you can foul whenever you want and people don't have to sit down. And that is what makes it kind of boring.

While Marsha (HSS) stated:

I would keep volleyball co-ed cause I like the competition against other guys cause they always say that you are just girls and we can beat the pants off of you. And then we beat them and they know you are better than what they thought you were.

The low skilled boys also preferred matching teams by skill level. They felt the low skilled girls were less likely to harass them than boys from other skill groups. Chris', a self described low skilled boy, statement reflected the sentiments of several low-skilled boys:

When you do something good, it's like all right. But do one little mistake and they are all over you. They are all mad at you. It's more the boys than the girls that do it. The girls don't always do that well even if they are on the team, so they really can't say anything to you.

All low skilled girls resented co-educational physical education classes/units. They cited harassment and critical remarks from classmates as their reason for wanting physical education classes to remain separate by gender. Although some disagreed, most felt it was the middle-skilled boys who were the perpetrators. As Sophia (LSS) said: "I think some boys will give you a hard time but not all of them. Some girls will criticize you but nothing like the boys." And Tanya (LSS): "Keep it separate. When you play with the boys, they criticize you and everything. If you can't run, they say you are too fat and if you can't play volleyball, they laugh at you. Boys are terrible."

Co-educational physical education was viewed by the high skilled students as an opportunity to play with more similarly skilled students than would otherwise be in their own class. This was especially true for the high skilled girls. Low skilled girls viewed co-educational physical education as unsafe because of the harassment largely from middle skilled boys that occurred in the class, where as gender segregated classes were considered unsafe for the low skilled boys.

“I will probably be a couch potato”

Participation in organized activity both currently and in the future varied by skill levels. Only those involved in athletics, 19/26 of the high skilled students, were currently active outside of their physical education class. The athletes planned to continue playing high school and summer sports and to enroll in a required weight training course every year until graduation. Among the other 7 HSS students, none were currently planning to enroll in physical education class again. Their reasons included scheduling conflicts and lack of interest due to their perception that physical education class wasn't challenging for them. As Tony (HSS) expressed:

We don't do enough physical stuff. Like last year before gym, everyone hated it, but we had to run 10 laps before we played the games. And you got in a lot better shape but I mean everyone hated it. But like this year all we do is play games.

All 7 high skilled non-athletes felt they could get enough activity outside of school. However, only 4 had participated in any organized sport during the year-summer softball.

None of the low skilled students planned to enroll in another physical education class and considered themselves unlikely to do any organized physical activity on their own. Most had the attitude of Chris (LSS): “Why should we continue to do something that we are not good in

and people yell at us if we make a mistake. I just don't need that.” or Julie (LSS):

What's the point? I spend all my time trying to figure what side we were supposed to play on. I kept hitting it the wrong way. I don't think it was very fun. I got more chalk on me than I got to bit the ball.

Two of the low skilled students indicated they might take gym again, if the nature of the activities would change and become less competitive or more skill oriented. They didn't think either change was likely. Jason (LSS) suggested:

I don't like to play volleyball. I wouldn't mind playing it if I was better. Maybe then I would like it more and play it more often. Sometimes you might play at a church picnic, but you don't really play it much.

Although none of the low skilled students were physically active outside of physical education class, a few did say they swam recreationally during the summer. Louise (LSS) stated: “I can't swim but I like to be in the water. Like being in the water with your friends. I can swim a little bit now because they taught me.”

In this study those who were already active, planned to remain active and those who were not active did not plan to be active in an organized physical activity in the immediate future.

“Why try?”

Whether students thought they could improve or not was closely related to skill level. High-skilled students tended to work on skills until they achieved a degree of mastery with which they were satisfied. Being successful was due to hard work in their minds. Tim (HSS) said it this way: “I am good in everything, especially football, basketball, and baseball. I worked good to be good at them. I practiced long hours.” And Beatrice (HSS) said:

I have fun swimming when I am with my friends cause I can mess around and stuff But like when we are doing the test I don't like it because I knew my grade was depending on it. We had to go under water and hold our breath to the other side. My friend got it the first time but I could barely make it past the halfway point and that bothered me. I pushed myself in there and I guess I just got mad at myself. One day I just said "Okay" I am taking it now cause I have practiced 5 or 6 times today. I went down and said to myself "okay, go as far as you can and if you can't do it, it's only one part of your grade". I went down and got a "7" which is a low A. And that's what I was shooting for, either a "6" or a "7".

Low-skilled students, however, if successful considered it luck or because of the teacher's help. Success was considered to be mastering a skill or playing on a winning team. Melissa (LSS) expressed success in this manner:

I can't hit the ball very good in volleyball. I have tried before but I am not good at it. I don't know why. The teacher taught us some serves and then we played games. Sometimes I could get the ball over the net, sometimes.

Perceptions of effort differed between students. Low skilled students separated other low skill students into two categories; those who try and those who don't. George (LSS) commented: "Some do try, but some don't have the skills and they don't care if they mess us. They don't care. They might just stand there and let the ball go past them." When asked to describe their own skill level, many of the LSS chose to call themselves middle to low. The low skilled students cited the lack of skills and non-interest as the main reasons they remained low skilled.

Higher skilled players, conversely, considered all low skilled students as low skilled because of

their lack of effort to practice the skills. Fred (HSS) observed:

In badminton a lot of people don't even try so it is boring. We may play a team who says let's just say you won by 8 points. And you know they are not going to play anymore so you might as well take the score.

or Tommy (HSS) talking about the LSS in the class mentioned:

Some people just stand there and let you serve it over and they just go oops when it falls to the ground. I think some people think it is cool. The think they can make people laugh at them. They seem to have fun fouling. They don't think they have to do anything they don't want to do.

In general, high skilled students attributed their success to internal sources of ability and effort (hard work and practice); whereas the low skilled students saw little improvement in their skill level—some continued to try, others stopped.

Discussion

The purpose of this study was to identify the physical education experiences of ninth graders, and their perceptions on participating in physical activity once their requirement for physical education was completed. As in previous studies, students perceived physical education classes to be fun and enjoyable if successful in the activity (Carlson, 1995; Portman, 1995b; Sanders & Graham, 1995; Tinning & Fitzclarence, 1992). A large percentage of students interviewed experienced physical education as intolerable and unsafe. These experiences, also, have been confirmed in previous studies (Carlson, 1995; Portman, 1995b; Sanders & Graham, 1995).

The role of effort for the high skilled students corresponded with the views of 4th and 5th

graders in Lee, Carter, & Xiang (1995) study. These students viewed effort, interest, and skill as determinants of success within the physical education program. The low skilled students were failure oriented tending to blame others for their successes and themselves for failures. In this study, the low skilled students viewed each other as either disinterested or unskilled and attributed success to luck. These findings were similar to findings by Portman (1995a, b) and Walling & Duda (1995).

To cope with failure in physical education class, the low skilled ninth graders in this study had decided not to participate in regular vigorous physical activity in the immediate future. Refusing to participate was a strategy also used by some individuals in studies by Carlson (1995), Hopple & Graham (1995), and Portman (1995a, b).

One suggestion made by students to improve physical education was grouping students by skill levels. Grouping students by skill level was important particularly for high skilled girls and boys and for low skilled boys. Due to the separate nature of the classes I observed, the high skilled girls wanted the opportunity to play with high skilled boys, or at the very least to play against a partner as competitive as themselves. Tolerating performances by lesser-skilled players on their teams make physical education classes boring for them. Low skilled boys supported coeducational physical education because they felt safer (less criticized) with girls than in a class of boys only. Only the low skilled girls preferred to separate students by gender. These girls perceived all boys, but especially the middle skilled boys, to be perpetrators of criticism towards them. Student support for single sex physical education classes was found in the recent (1998) study by Treanor, Graber, Housner, & Weigand. The authors asked 446 middle school students to complete a questionnaire after participating in both co-educational and single sex physical education classes. A majority of students indicated a preference for single sex classes.

The fact that none of the classes I observed were co-educational was a surprise, although this finding was recently supported in an article by Napper-Owen, Kovar, Ermler & Mehrhof (1999). These authors found that only 71% of the surveyed high schools within AAHPERD Central District reported compliance with Title IX for ninth grade physical education classes. Compliance was defined as boys and girls participating together in all activities except contact sports. Further studies on Title IX compliance in physical education seem needed.

A second suggestion by the students was to allow them to choose their own partners or teams, in this way the students could play with their friends. Friends were important motivators for all students. They were usually of the same gender and skill level. Friends of high skilled students were equally competitive and skilled and they challenged each other to excel. Low skilled student's friends offered support and encouragement in the face of failure. For both groups, friends were safe persons with whom to associate within the class (e.g. Aicinena, 1991; Carlson, 1995).

The 9th graders in this study reported little changes in their physical education classes across grades. They had definite ideas about what they liked and what they didn't like. Their likes and dislikes may have been formed as early as kindergarten (Sanders & Graham, 1995). In this study, high skilled students liked to be challenged by learning new skills, further mastering of previously learned skills, or by playing games with others of their same ability. Low skilled students wanted to eliminate the current team and individual games program, favoring the mastering of basic motor skills or non-competitive activities. The physical education program they had experienced reflected a traditional multi-activity program that emphasized team and individual sports. The predominance of this type of curriculum in ninth grade physical education programs was supported by the findings by Napper-Owen et al. (1999).

Have physical education classes helped increase participation in regular vigorous physical activity? According to the students in this study, the current athletes planned to remain physically active (in sports) once their physical education requirement was completed. The high skilled students who were not in an athletic activity felt they were not challenged in physical education class and had no current plans to do more than pick-up games or swim after school. Physical education experiences of the low skilled students appeared to hinder their participation in any organized physical activity once their requirement was completed. These students reported finding little success during class and were often criticized for making mistakes.

Students' excitement about physical activity in their school years is closely associated with a life-long interest in activity. The Surgeon General's report (U.S. Department of Health and Human Services, 1996) called attention to the fact that how children are treated in classes and youth sports/athletics will affect whether or not they stay active later in life. Things to avoid included using exercise as punishment and relegating fitness to regimented activities. Student enjoyment and experiences of personal success were related to a desire to be active. The report asked teachers to integrate fitness concepts throughout the school curriculum and especially within physical education classes. Fitness activities, other than testing, were not an integral part of the curricula the students in this study experienced. Altering the curriculum to reflect lifetime fitness activities would have been supported by the high skilled non-athletes and the low skilled students as the focus of the physical education program would then shift from competitive sports and games to individual goal setting and accomplishments.

If our intent as physical educators is to encourage students to participate in an active lifestyle in the future evidence suggests we are not meeting our goals. Changing the curriculum, increasing opportunities to participate, mixing

teams by ability and gender, and eradicating criticism and harassment by higher skilled students might encourage some of the non-active students to become active. In addition, recognizing difference in attitudes towards activities, in participation patterns of students by gender and skill level, and in comfort levels of students working with the same or opposite gender might allow teachers to design learning environments sensitive to student needs.

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