The effect of the use of self-regulated learning strategies on college students' performance and satisfaction in physical education

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Abstract

The purpose of this study was to investigate whether using self-regulated learning strategies could promote college students' learning and satisfaction in Physical Education.

A quasi-experimental design, experimental group (N =49) and control group (N=51), was used to examine the effectiveness of a teaching intervention in achieving the goals of learning and satisfaction. Students undertaking the self-regulated learning intervention were compared with a group participating in standard curriculum instructional conditions. Three questionnaires were administered to identify 1) students' entry characteristics, 2) their perceptions of their learning experiences, and 3) satisfaction. Students completed a students' characteristics questionnaire in week 2. During the module, students responded to a learning experience questionnaire. At the conclusion of the module, students completed a tennis skills test and responded to a satisfaction questionnaire.

The conceptual framework for this study included the independent variables of teaching strategy, mediating variables (students' characteristics), and dependent variables (satisfaction and performance). The experimental study was conducted within this framework by use of an ANCOVA design.

The main results were:

1. The experimental group scored significantly higher on measures reflecting self-regulated learning processes in their learning experience than the control group (p=0.000).
2. There was no difference between the groups on scores for global satisfaction (p=0.059).
3. There was no difference between the groups on satisfaction through valuing (p=0.401).
4. The experimental group demonstrated significantly higher students' satisfaction through enjoyment than the control group (p=0.013).
5. The experimental group had significantly higher performance in the tennis skills test than the control group (p=0.000).

Several effects of self-regulated learning were indicated in this study. Analysis of the monitoring sheets provided evidence that students gained more interest and confidence in their involvement in the tennis class by the use of self-regulated learning strategies. However, it was expected that the self-regulated learning group would experience the greater satisfaction. As this did not occur, more research is needed to further examine the relationship of learning experiences to satisfaction and particularly the dimension of valuing.

The importance of utilizing a conceptual framework that accounted for differences in student entry characteristics in a teaching intervention of this nature was demonstrated by the ANCOVA analysis. The individual factors of managing environmental change, problem solving, ability attributions, and task orientation were all shown to have some significant effects on student outcomes over and above those attributed to the learning experience.

Finally, some interesting findings concerning the composition of the scales used in the study were reported. They were interpreted as providing evidence for the importance of verifying the cultural appropriateness of even well-known theoretical concepts that may have been developed in different contexts to those in which they are being used. The study concludes with some specific recommendations for future research.

DECLARATION

This thesis contains no material published elsewhere or extracted in whole or in part from a thesis by which I have qualified for or been awarded another degree or diploma. No other person's work has been used without due acknowledgment in the main text of the thesis. This thesis has not been submitted for the award of any degree or diploma in any other tertiary institution. All research procedures reported in the thesis received the approval of the relevant Ethics committee.

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Man-Chih Ao
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CHAPTER ONE

Introduction

In an era of ever-advancing science and technology, what is important in teaching is to teach students how to learn. Current psychology of education focuses on intrinsic motivation and autonomous learning in order to achieve this sort of outcome (Pintrich, 1999; Cheng, 2001). However, in a recent investigation, Wang (2005) reports on how 14- to 18- year-old teenagers evaluated their parents in eight Asian countries (Thailand, Indonesia, Malaysia, South Korea, Philippines, Singapore, Hong Kong, and Taiwan). Taiwanese parents recorded the highest scores for concern about the academic performance of their children. These concerns are often seen as a reflection of the "academic-consciousness ", one of the results of which is seen to be the favoring of a passive learning style as the means to achievement of higher grades.

A considerable number of studies have been conducted in education, which demonstrate that self-regulated learning can enhance students' academic achievement and facilitate learning motivation (Lin & Chen, 1995; Pintrich, 1999; Zimmerman & Martinez-Pons, 1986, 1988). In the sports domain, some researchers have also explored the relationship between self-regulated learning and performance (Anshel & Porter, 1996; Kitsantas & Zimmerman, 1998; Nietfeld et al., 2003). Results have shown that there is an interaction between self-regulated learning and performance. However, there are few studies reported that have attended to the self-regulated learning of college students in physical education classes in Taiwan (Kao, 1998). There is a need to explore and understand the benefit of using self-regulated learning strategy in this specific area of the curriculum for Taiwanese students.

The concept of self-regulated learning implies a teaching strategy that enables individuals to develop their own goal-directed learning processes. It not only promotes individual learning, but also provides opportunities for students to actively engage in learning processes such as goal setting, self-monitoring, self-evaluating, self-reinforcement, and resource management. Both Piaget and Vygotsky (as cited in Chen, 1996) mentioned that an important goal of teaching should be to lead the students to spontaneous psychological activity and active participation, so that they can actively explore and think, and furthermore construct their own knowledge. Self-regulated learning is therefore an

important strategy to enable individuals to use skill and knowledge construction processes. This has arguably become an essential competence in an ever-changing society. By constructing new skills and knowledge, self-regulation can be defined as sustaining and activating one's own cognition, behaviour and motivation (Karoly, 1993).

Self-regulated learning is an integrated learning process whereby learners control their own motivation, cognition and behaviour. It includes two sub-processes: motivational beliefs and strategy use, and, can be seen as the integration of "will" and "skill". "Will" refers to the learner's goals, values, and expectations (or motivational orientation). "Skill" refers to the learner's use of different strategies of cognition, meta-cognition, and resource management (Garcia, 1995). Many international studies in physical education have focused on motor skill performances, but only a limited number of results have been reported relevant to the pedagogy of physical education in Taiwan. For example, The National Council of Physical Fitness & Sport (White Report, 2000) indicated that there were 4482 studies of Physical Education related to pedagogy, sport psychology, exercise science, sport medicine, sport technique, sport society, or sport administration in the past thirty years. Of these only 568 studies related to teaching, learning, perception, assessment and curriculum in physical education.

Zhau (as cited in Fang, 1997) indicates that motor learning involves three components: perceptual learning, decision-making learning and effector learning. She argues that teachers only focus on effector learning and overlook the other two factors in lesson plan and learning goal design. Vealey, Hayashi, Garner-Holman and Giacobbi (1998) surveyed 335 college athletes while developing a questionnaire to understand the sources of improving sporting confidence. Their findings suggested that nine sources of sporting confidence could be categorised into three broad areas, namely achievement, self-regulation and climate. Achievement implies self-mastery and the demonstration of ability. Self-regulation includes the provision of physical and mental preparation and physical presentation. Climate involves social support, coaches' leadership, vicarious experience, environmental comfort and situational favourableness. Clearly, motor learning is an integrated learning process and we should not stress effector skills alone while neglecting perceptual learning or decision-making processes. Self-regulated learning is an innovative approach to promote a sense of belonging, and it provides students with a role in decision-making and offers a supportive approach to learning. Conversely, the traditional approach

tends to be prescriptive with coaches emphasising skills in the learning processes rather than enjoyment and the individual's development. Much of the research suggests that whatever teaching style is used, it is important to help students to respond better to supportive coaches rather than 'inflicting' coaches (Smith & Smoll, 1996).

The implication for teaching is that instructors should engage in a supportive learning climate in order to enhance student learning experiences and successful learning outcomes instead of focusing on a mastery climate alone (Standage et al. 2003). Self-regulated learning with a student-focused learning climate could lead students to contribute more actively to the attainment of their learning goals.

1. 1. Current Problems of Physical Education

Zhou (1994) indicated that some teachers have explored different teaching methods and strategies such as collaborative learning, Mosston's (1994) spectrum of teaching styles, the use of verbal cues and feedback. Yet teachers in general like to stick to convention and give little attention to innovation in their physical education teaching. The academic achievement-oriented society in Taiwan seems to prevent students from taking part in much physical activity. Parents are concerned about academic success above all and so they do not like to let their children play in school teams or take much time for sport and exercise because they think it will take time away from their academic studies and therefore cause them to do badly in their other subjects. Thus, students seem to focus on examination success and put little emphasis on the learning of movement culture, and related values such as enjoyment or fun. Students focus more on grades in their academic subjects and show a lack of active commitment to learning sports and participating in exercise. In addition, concerns about the value of physical activity in education are sometimes heightened by examples from the commercialization of sport, which appear to have impacted negatively on sports education (For example, people like to worship sport idols without realizing they themselves need the benefit of participating in sport for their own health and to avoid the problems of inactivity).

According to the Taiwanese National Councils' report on Physical Fitness & Sport (White Report, 2000) difficulties faced by physical education teaching at university level is attributable to three factors: facilities, students and teachers. The main factor is that facilities and equipment are insufficient (53%) and the second one is the students' attitudes

to learning (33%). Teachers consider that the most difficult aspect of teaching is how to understand the students. Teachers are dissatisfied with the attitude the students show towards their learning. Moreover, the teachers think that it is hard to relate to the interests of students and complain about this at great length. Teachers also argue that students show insufficient skill and physical fitness. Therefore, effective teaching strategies and the pedagogy of physical education are major concerns for physical education teachers.

1. 2. Implications

From a student-centred viewpoint, instructors of physical education must not overlook the life skills of decision-making, goal setting, problem solving, self-assessment, and health advocacy in their physical education courses. Furthermore, teachers should adjust their teaching methods, attitudes, and evaluation in order to decrease students' sense of failure and frustration and increase students' self- confidence and motivation to learn physical education. Nagashima (1990) indicated that if the valuing of movement was situated at the core of movement learning content, this could help with satisfying and sustaining participation in movement, thus leading to spontaneous learning and self-realisation.

Concern for the above issues has led the researcher to examine the value of self- regulated learning in physical education. The aim of the present study is therefore to explore the relationship between self-regulated learning pedagogy and learning outcomes for physical education classes.

1. 3. Significance of the Study

As discussed above, research relating to physical education pedagogy is very limited in Taiwan. Very few attempts have been made to develop understanding of the area of self-regulated learning for physical education. It is however proposed that self-regulated learning could help students to better achieve the goals of physical education, by increasing their disposition to engage in physical activity which in turn, would lead to their becoming life-long learners. It is also possible to teach in ways that can facilitate the development of self-regulated learning. For example, students, who use self-regulated strategies, have demonstrated higher achievement than students who do not use these strategies (Zimmerman, 1994; Mau & Chen, 1993). Therefore, this study could provide information on sports pedagogy in order to improve the application of teaching strategies in physical education.

1. 4. Delimitations

There are two main delimitations associated with this study. Firstly, the study is limited to two tennis classes. Secondly, the participants are college BN (Bachelor of Nursing) undergraduate students in Tainan city, Taiwan. Therefore, generalizability of the results from this research will be limited when seeking to apply them to other students located in other cities in Taiwan and further a field.

1. 5. Definition of Terms

For the purpose of this study, the following terms are defined:

Self-regulated learning: learning processes whereby students use personal strategies to strategically regulate their behavior and immediate learning environment (Zimmerman, 1989).

Learning strategies: the self-regulated learning strategies students use in order to achieve learning goals. This study will specifically examine goal setting, self-monitoring, self-evaluation, self-reinforcement and resource management strategies.

Goal setting: planning for the sequencing, timing, and completing of activities related to students' educational goals, or sub-goals by students and teachers (Zimmerman & Martinez-Pons, 1986).

Ego-Orientation: an attitude where individuals prefer to compare themselves and their performance with others, by trying to exhibit high ability through winning and high normative performance, and feeling satisfaction when establishing superiority (Duda, 1992).

Task-Orientation: an attitude where individuals pursue achievement behaviour in circumstances where learning or mastery is deemed important. Perceived competence is self-referenced and dependent upon improvement and learning. Success or failure is dependent upon the subjective assessment of whether one has achieved mastery, learned or improved on a task (Duda, 1992).

Self-efficacy: students' perception of competence in their learning task (Bandura, 1986).

Self-evaluation: refers to students' perception of their current performance and comparison with previous performances (Bandura, 1986).

Self-monitoring: students' awareness of their actions, which is a prerequisite to self-regulating behavior (Zimmerman, Bonner, & Kovach, 1996).

Metacognition: a person's knowledge about their own cognitive process and outcomes and the monitoring, regulating and commanding of their cognition (Flavell, 1976).

CHAPTER TWO

Literature Review

The purpose of the present study is to explore the relationship between the implementation of self-regulated learning pedagogy and successful outcomes for physical education classes. There are seven sections to the literature review in this study. The first section describes research trends in physical education teaching and learning. The second section focuses on attempts to solve the physical education problems. The third section is concerned with physical education and its contribution to the educational curriculum. The fourth section reviews the concept of self-regulated learning. The fifth section looks at some of the ways in which individual differences can impact upon learning. The sixth section summarises the importance of self-regulated learning for physical education. The last section summarises the previous research with regard to self-regulated learning.

2. 1. The Research Trends in Physical Education

From the perspective of contemporary education, Tsujino (1991) stated that "institutionalization of values" and "modernized poverty" have contributed to a lack of desire for autonomy of learning and poor ability in problem solving. By 'institutionalization of values' he meant that the values of education and the institutions aiming to fulfill these values were confused; in 'modernized poverty' he saw a state of mental parsimony.

In addition, though the concept of education had been expanded and the concepts of life-long learning, life-long education and the learning society had emerged, it seemed that in Asia all the responsibility for education was placed on schools. To be concrete, education needs to place more attention on informal education, with its links not just to school, but also the family, the community environment, individual persons, and the natural conditions and social customs of the society, all of which together influence individuals' development. Failure to do so has resulted in the problems in education reflected in the rejection of going to school, violence in school, vicious competition, overemphasis on 'cram' schools and so on (Tsujino, 1991).

Moreover, currently, a number of psychologists of education have suggested that the

learner should be actively involved in the process of learning instead of engaging in passive learning (Chen, 2002, Pintrich 2000, Zimmerman & Martinez-Pons, 1986). In the domain of physical education, with the automation of the industrial society, on the one hand, people enjoy convenience in their lives, but on the other hand, the associated physical inactivity contributes to significant negative health consequences. Zhuo (1999) investigated the model of physical fitness for 20403 university and college students in Taiwan. The results showed that 27% of males and only 12% of females took the recommended exercise three times each week and persisted for twenty minutes each time. The physical fitness of Taiwanese youth was also inferior to the same age students in China, Japan, United States and Hong Kong. Results indicated that future social elites have lost the foundation of health from a young age.

Therefore, curriculum reform in physical education is needed to strengthen physical fitness and the ability to independently practice physical activity. In turn physical education also needs to seek support from the family and the social environment. In other words, the school curriculum needs to reflect the social interactions and realities experienced by learners.

2. 2. Attempts to Solve the Education problems

To solve the above-mentioned problems in education, educational reform in response to these social needs is necessary. However, Tsujino (1991) argued that it is necessary to reconstruct institutions from their school-centred educational focus to a life-long learning system focus and from an academic achievement-conscious society to a learning society. In terms of developing a life-long learning system, there are several fundamental requirements when considering the school's role. These are

1.To foster the individual's ability to meet life-long learning needs through self-instruction.
2. To consider individually adapted education.
3. To improve educational curricula in terms of their flexibility and diversity.
4. To pursue the concept of an open-minded school collaborating with the society around it.

Moreover, current psychology of education focuses on intrinsic motivation and performing autonomous learning in order to solve this sort of educational problems. Self-regulated learning has arguably become an essential competence in this ever-changing society, due to its being able to provide a way to develop the student’s goal-directed learning processes. It

not only promotes individual learning, but also provides opportunities for students to actively involve themselves in learning processes. Conversely, traditional instruction tends to dominate the learning processes and emphases movement to perform rather than understanding and problem solving. This teacher centred approach appears to limit students' access to autonomous learning and to be related to poor performance quality. Therefore, in this thesis the researcher attempts to explore the self-regulated teaching-learning strategies and add to the understanding of what is going on when learning takes place in this mode.

2. 3. Physical Education and its Contribution

The fundamental goals of physical education and sport are to cultivate an interest in physical activities, to develop basic competence in and knowledge of physical skills, to form the habits of life-long movement, and, to shape a well-rounded citizen (National Ministry of Education Report, 1995).

In order to achieve these goals, it is necessary to re-examine teaching-learning processes, as they are currently conducted by teachers and experienced by students.
Recently, some curriculum researchers in physical education have been focusing on the 'value orientation' theory. Jewett, Bain, & Ennis (1995) described five value orientations in physical education: disciplinary mastery (emphasising the mastery of sports skills and their health-related exercise content), learning process (focusing on teaching students to become autonomous learners), self-actualisation (based on student-centred development and autonomy), social reconstruction (paying attention to the value of social reform, especially cultural reform), and ecological integration (considering the meaningful development of the individual and effective citizenship). They believe different teachers' beliefs serve to provide different frameworks for curriculum design and teaching behaviour. All of these, in turn, can influence students' learning experiences. These value orientations are based on the interrelationships of content, learner, and social expectation. These value orientations and their interrelationships are identified as follows:

2. 3. 1. Disciplinary Mastery

A disciplinary mastery orientation is focused on content knowledge and relevant training, especially in the area of sports skills. The goal is to provide feedback and maximum practice in order to achieve skills mastery. Disciplinary mastery has a clear and definite

assessment standard. The social expectation is that this will pass on health-related knowledge and skill for helping learners to live healthy lives. Table 1 lists the main concepts relevant to the disciplinary mastery orientation.

Table 1. Domain specifications for the disciplinary mastery orientation

Domain Sentence: Students gain proficiency in fundamental movement, skill, sport, and fitness activities; a cognitive understanding of rules, strategies, and scientific principles associated with increased performance; and an appreciation of these in an active, healthy lifestyle.

The curricular focus is placed on the following major concepts:

A. Knowledge base
1. Students learn physical skills and activities.
   a. Students learn fundamental movements, skills and sports.
   b. Students learn exercise sequences and routines that contribute to fitness.
2. Students develop cognitive understandings.
   a. Students understand rules and strategies.
   b. Students learn scientific principles (e.g., biomechanical, physiological).
   c. Students learn movement concepts (e.g., body, space, effort, relationships).
3. Students learn to value and appreciate physical activity.
   a. Students value the importance of skill and knowledge in an active lifestyle.
   b. Students appreciate the role of knowledge as a necessary component of performance.

B. Competence
1. Students master criterion-referenced standards.
2. Students compare their own performance to others using norm-referenced measures.
3. Student proficiency is based on developmentally or experientially appropriate criteria.

C. The knowledge base is transmitted to each new generation of students.
1. Students learn skills and knowledge that enable them to participate with others.
2. Students learn skills and knowledge that enable them to participate in active, health full lifestyles.

After, Ennis, & Chen, (1993), p. 438.

2. 3. 2. Learning Process

Due to the fact that school curricula cannot cover all the knowledge available to society because of the rapid increase in knowledge, the focus of the learning process orientation is to learn how to learn. Learners learn movement, sport and physical fitness by way of mastering the processes. In terms of the learners, it is expected they will develop knowledge and skills to solve problems related to movement and sport. The social

expectation is for the development of systematic learning processes to underpin life-long learning. Table 2 shows the main points of the learning process.

Table 2. Domain specifications for the learning process orientation

Domain sentence: Students learn how to learn movement, sport, and fitness content and how to use information from the body of knowledge to solve related problems. Process skills are integrated across lessons and units in systematic progressions to facilitate the learning of increasingly complex skills.
The curricula focus is placed on major concepts:
A. Learning how to learn
1. Students acquire process knowledge associated with learning movement, sport, and fitness concepts that is integrated across content (e.g., thinking skills, observation, movement analysis, utilisation of feedback).
2. Students synthesise scientific concepts necessary to explain efficient performance within and across skill, and fitness components (e.g., accuracy, velocity).
B. Applying knowledge
1. Students use knowledge and skills to solve relevant movement, sport, and exercise problems.
2. Students recognise relationships to solve relevant movement, sport, and exercise problems.
3. Students recognise movement and fitness concepts integrated across major knowledge and performance categories (e. g., object manipulation, balance).
C. Developing systematic learning progressions
1. Students develop an understanding of content relationships that facilitate the addition of new knowledge to prior knowledge.
2. Students participate in tasks planned to introduce increasingly complex skills.

After, Ennis, & Chen, (1993), p. 439.

2. 3. 3. Self-actualisation

The self-actualisation orientation is focused on helping the learners develop their self-concept and confidence. Therefore, teachers help learners successfully challenge difficult movement tasks and effectively participate in existing play or game activities. As for the learner, the value orientation of self-actualisation emphasises the experience of enjoyment in participation in physical activities and the attainment of confidence and communication skills. As for the social expectation, the individual's development is the priority. Table 3 shows the main concepts of the self-actualisation orientation.

Table 3. Domain specifications for the self-actualization orientation

Domain Sentence: Students learn to become increasingly self-directed, responsible, and independent. They are encouraged to learn about themselves as they grow and develop their own characteristics and abilities.

The curricular focus is placed on the following major concepts:

A. Independence
1. Students learn to be self-directed.
2. Students participate in tasks designed to develop responsibility.
3. Students learn to work autonomously.
B. Individuality
1. Students are encouraged to define their own needs and interests.
2. Students are placed in situations where they will gain self-knowledge/self-understanding.
3. Students develop awareness of their own unique capabilities.
4. Students are encouraged to pursue activities consistent with their personal needs /interests.
C. Positive student growth
1. Grow is defined individually (e.g., knowledge, skill/fitness, personal/social development for each student.
2. Grow is marked by success in tasks considered to be relevant to the student.
3. Students participate in program options designed for their own needs.
4. Students design their own programs.

After, Ennis, & Chen, (1993), p. 440.

2. 3. 4. Social Reconstruction

The social reconstruction orientation focuses on the encouragement of students to learn to interact with the group and to cultivate co-operation, a sense of responsibility and leadership skills. It encourages the students to bring up critiques and solutions related to politics, economics, society, peoples, gender discrimination, and medical issues and so on. For the learners, it focuses on enhancing their ability in democratic processes, leadership skills, cooperation, problem solving and critique. The social expectation is that this learning will reconstruct a society with a vision. Table 4 shows the main points of the social reconstruction orientation. .

Table 4. Domain specifications for the social reconstruction orientation

Domain Definition for Social Reconstruction (Original Value Orientation Inventory) (a): Students develop an awareness of social issues and learn skills and strategies necessary to change personal or group behaviors to create a better environment for all individuals regardless of race, class, gender, or physical ability.

The curricular focus is placed on major concepts:

A. Awareness of social needs/concerns/issues
1.Students develop sensitivity, empathy, and respect for group concerns.
2.Students realise the value of group goals in meeting individual needs (working for the greater social good).
B. Students learn skills necessary to act as a change agent within and for the group.
1. Students acquire the skills necessary to advocate effectively for self and others.
2. Students develop insights and strategies to work collectively for social justice (e.g., questioning the dominant viewpoint, negotiation, persuasion).
3. Students are empowered to make decisions necessary to test alternate solutions and select the best alternative.
4. Students are empowered to create or implement change.
C. Students learn skills and strategies necessary to create a better environment/society for all individuals regardless of race, class, gender, or physical ability.
1. Safe environment: physical safety (i.e., freedom from violence and abuse) and emotional safety (i.e., freedom from derogatory comments)
2. Equal access to opportunity: knowledge, learning, meaningful activity

After, Ennis, & Chen, (1993), p. 442.

2. 3. 4. 1. Social Responsibilities

Ennis, Ross & Chen (1992) conducted an experimental study which identified that teachers who held the value of a social responsibility orientation focused on cultivating students' ability in the processes of co-operation, participation, teamwork, responsibility and respecting others, rather than the goals of equity, reform and justice which feature strongly in social reconstruction. Table 5 therefore shows the focus of social responsibility orientation.

Table 5. Domain specifications for the social responsibility orientation

Domain Definition for Social Responsibility (Revised Value Orientation Inventory): Students learn social rules and norms for personal conduct that lead to appropriate social interactions of cooperation, teamwork, group participation, and respect for others.

The curricular focus is placed on the following major concepts

A. Positive social interactions
1. Students are encouraged to develop sensitivity and respect for group concerns.
2. Students learn social and interpersonal skills necessary to engage and affiliate.
3. Students learn social rules and norms necessary to interact with group members.
B. Co-operation/teamwork
1. Students are taught that group goals take priority over individual needs.
2. Students learn the importance of personal skills/knowledge to contribute to group success.
C. Participation
1. Students participate in tasks that emphasise the role of individual involvement in reaching group goals.
2. Students participate in tasks that emphasise the role of group involvement in setting and meeting personal goals.
D. Respect for others
1. Students learn to respect the rights of others.
2. Students learn to acknowledge the role of authority figures in social settings.

After, Ennis, & Chen, (1993), p. 443.

2. 3. 5. Ecological Integration

The focus of the content of an ecological integration orientation is to consider that all individuals must take responsibility for the environment and respect the meaningful development of the individual and effective citizenship. It relies on balancing the needs of society, the individual and their learning to apply knowledge and skills to solve individuals' problems. With regard to social expectation, it attempts to balance social expectations, individual needs and subject matter demands. Furthermore, it promotes the meaningful development of effective citizenship. Table 6 shows the concepts underpinning the value orientation of ecological integration.

Table 6. Domain specifications for the ecological integration orientation

Domain Sentence: Students learn to search for personal relevance as they integrate and balance their own needs and interests within the larger social and natural environment. They use knowledge both to respond to changes in their lives and to determine their own future.

The curricular focus is placed on the following major concepts:

A. Personal search for knowledge that is meaningful and interesting
1. Students participate in a variety of experiences.
2. Students learn to identify experiences that are useful and/or enjoyable.
B. Integration of individuals' needs with the natural and social environment
1. Students participate in tasks that integrate individual goals with group goals.
2. Students learn to apply knowledge and skill to solve personal and social problems.
C. Balance between societal expectations, student needs, and subject matter demands
1. Curriculum is flexible to respond to diversity within and among students and situations.
2. Program goals focus on long-term balance, although specific situations may require emphasis on one component over others.
D. Creation of opportunities in which to participate in the future
1. Students begin to identify and learn to participate in activities that they consider relevant.
2. Students acquire skills of critical questioning, decision making, and problem solving to project, modify, and extend skills and knowledge in preparation for changing lifestyles.

Ennis, E. D., & Chen Ang, 1993, *Research Quarterly for Exercise and Sport, 64*(4), 441.

As identified, disciplinary mastery, learning process and social reconstruction orientations tend to focus on improving students' learning and achievement performance based on teaching quality, curricula requirements, assessment standard, and social environment. On the other hand, self-actualization and ecological integration are focused on improving students' learning and learning outcomes based on student-centered competence. Therefore, in terms of physical education, instructors should understand the views and implications of these five value orientations. The way in which instructors actually implement value orientations into practice will depend on what current curriculum design instructors are considering.

When considering the value orientations in curricula, most physical education teachers

favor the disciplinary mastery orientation. This is not only reflected in teachers' beliefs, but also in the physical education curriculum's goals and society's needs (Jewett et al. 1995). Personal experience and observation, supports the notion that the Taiwan physical education curriculum design is based on the value orientation of disciplinary mastery. However, the ideal physical education curriculum design should consider students' view and needs. Future physical education curriculum design should incorporate the value orientations of self-actualization and ecological integration. Designing a more diverse curriculum in this way could increase students' learning motivation (Zhang, 1998). Rocha & Carreiro da Costa (1999) conducted an analysis of 12 physical education teachers and 252 junior high school students using the Physical Education Profile Observation Instrument (PEPOI) in association with cluster analysis. They reported that a) All teachers reported a multidimensional physical education concept profile, b) 61% of students favored a learning orientation, c) Two teachers showed a dominant control profile, d) There seemed to be a close correlation between the teachers' value orientation and their students' perception.

In addition, the characteristics of those students who were categorized as having a higher learning concept showed that a) They had a favorable image regarding the promotion of physical education learning, b) They preferred the promotion of physical condition and health, c) They felt a hesitation about the promotion of recreation and amusement.

The implication of these results is that physical education teachers should pay attention to the meaning, which is inferred by their students. They provide support for physical education teachers to design an effective physical education program, which embodies a concern for social expectations.

The present study embodies a concern with the process of movement and competence in performance skills. It emphasizes knowledge of solving movement problems and knowledge application; the design of curricula based on movement construction: body, effort, space and relationships. The teachers play a critical role in this learning process, that is, when students practice some movement or skills, the teachers ask them what the correct movement is and how to achieve the goal. The development process focuses on the value orientation of self-actualisation, emphasizing the learning of self-management and decision-making. Therefore, it is a student-centered learning style. The teachers are creators

of the learning environment and direct students to developing self-accountability behavior. Teachers depend on the students' needs to offer help and feedback.

Consequently, Lin (1998) suggested that the curriculum development of physical education should be: 1. Designed with a diversity of activities. 2. Teachers should not only realize their value orientation, but also need to consider the space-time environment to take account of different strategies for achieving a successful learning environment. 3. The curriculum development of physical education should be based on the study of physical education theory.

Zhang (1998) also stated that the current reform focus of the physical education curriculum could be described as follows:

1. Goal: The goals of physical education should incorporate an international viewpoint in response to the needs of the global village. In addition, physical education teaching should guide students to recognize and respect different sports cultures. It also should strengthen local sports and promote folk sports.
2. Content: To meet the needs of enhancing their ability to participate in leisure sports, teachers should pay more attention to students' interests and lead students to take optional courses earlier for later-on sports participation.

1.) Teaching method: Improving instructional skills in order to help students to enjoy the learning experience and achieve success.
2.) Assessment: Equally emphasizing the assessment of quality and quantity outcomes. Quality assessment involves observation and recording.
3.) Teacher: Responding to the need for optional courses, teachers should take some more courses in order to provide extra services to students in areas such as sport counseling, sports research and so on.

As already mentioned, in this era of ever-advancing science and technology, what is important in teaching is to teach students how to learn. Current psychology of education focuses on arousing intrinsic motivation and developing autonomous learning strategies. Self-regulated learning provides a means to move beyond teacher-centered teaching models and to provide active and fun-filled learning. Contemporary education needs to focus on fostering the ability of self-education. Learning to learn has become an important issue.

2. 4. The Concept of Self-regulated Learning

Zimmerman (1989; 1990) states that self-regulated learning has three main characteristics. Firstly, the learners' internal motivation will be aroused. Secondly, the learners will get involved meta-cognitively in the task. Thirdly, the learners will actively take measures to construct their own learning modes. Bandura (1986, 1991) emphasizes the self-efficacy expectation as it relates to the influence of behavioral motivation. He proposes that using goal setting, self-evaluation, and self-reinforcement builds and maintains a behavioral motivation. These processes are the basis of self-regulated learning mechanisms. Karoly (1993) has undertaken an extensive review of the self-regulation mechanisms underlying cognitive and somatic based learning in therapy and performance. Self-regulation appears to be the stable element attempting to guide behavior along a specific path to a directed aim or goal. Pintrich (1995) indicated that self-regulated learners would be able to attempt to control their behavior, motivation, and cognition and identify achievable goals. Schunk (1996) argued that the self-regulated learning process involves motivation (self-instruction, attribution, achievement motivation, and task value) and cognition activities (meta-cognition, self-monitoring, and self-evaluation). Nahas et al. (2003) examined the determinants of physical activity in adolescents and young adults for high school and college physical education. They indicated that behavior modification stresses on applying self-regulation skills and increasing social support to promote physical activity participation, whereas, cognition-behaviorism not only highlights self-regulated strategies, but also emphasizes motivation beliefs. Ommundsen (2003) examined the relation among thirteen to fourteen-year-old secondary school students (n=343) with regard to implicit theories of ability and their use of self-regulated learning in physical education. Results revealed consistent positive relationships between motivational beliefs and students' use of self-regulation strategies.

Social cognitive researchers have focused on self-regulated learning and its related processes, including self-reinforcement (Bandura & Kupers, 1964), self- efficacy (Bandura, 1982), goal setting (Tubbs, 1986), self-evaluation (Badura & Cervone, 1983) and self-instruction (Schunk, 1986). They have developed an integrated theoretical model, which can be used to explain the individual self-regulated learning process. Garcia (1995) indicated that self-regulated learning comprises the learner's will and skill. Will refers to the learner's motivational orientation of goal, value, and expectation. Skill refers to the learner using different cognitive, meta-cognitive, and resource management strategies.

Bandura (1986) pointed out that self-regulated learning involves three sub-processes: self-observation or self-monitoring, self-judgment, and self-reaction, all of which interact with each other. Self-observation emphasizes self-recording and the standard to be attained as evidence of progress. Self-judgment refers to the way in which individuals compare their current performance with the goal; it can be affected by the evaluation criterion, the characteristics and importance of the goal, and attribution. Self-reaction focuses on personal and environmental encouragement. Personal encouragement relates strongly to personal progress. Environmental encouragement occurs when students perceive the learning environment as being supportive of their self-esteem.

According to the above theories, self-regulated learning is an integrated learning process, which occurs when individuals attempt to adjust the characteristics of their own behavior, motivation, and cognition to best suit their own learning. It is most important that both control and goal setting come from within the student and are not externally imposed. As identified, self-regulated learning refers to individual's spontaneous and self-directed learning.

2. 5. Self-regulated Learning Theories

Zimmerman (1989b) and Schunk (1996) have integrated many theories of learning into four major theories: operant conditioning, cognitive development, social-cognitive and information processing theory. This section describes the main features of the self-regulated learning related to these four theories.

Table7. A summary of self-regulated learning theories (Schunk & Zimmerman, 2003, pp, 59-68)

Characteristics	Operant Conditioning	Cognitive Development	Social Cognitive	Information Processing
Key to learning	Reinforcement	Self-regulation	Modeling & Observation	Mental Processing
Regulating process	Self-monitoring Self-instruction Self-reinforcement	Observation Emulation Self-control Self-regulation	Self-observation Self-judgment Self-reaction	Select Organize Rehearsal Map

Table 7 provides a summary of these major learning theories applied to self-regulated learning. It shows Behaviorism, Cognitive Development, Social Cognitive, and Information processing perspectives on the self-regulated learning processes. Firstly, psychologists emphasize that individuals decide their internal self-regulated behavior link with the external stimuli of the environment. In other words, the behavior that occurs depends on its consequences. The function of reinforcement is to strengthen the discriminative stimuli for the regulated individual's behaviors. Furthermore, self-reactiveness depends upon self-recording to understand self-reflection. The main regulating processes are self-monitoring, self-instruction, and self-reinforcement. Column one shows how operant conditioning theory focuses on the use of the processes of self-monitoring, self-instruction, and self-reinforcement for setting up and modifying the learning behavior. It reflects the behaviorist perspective; however behavioral responses are confined to the provision of external cues, and tend to be dependent and passive.

Secondly, in column two, the cognitive development perspective focuses on learners exerting control over their thoughts, feelings, and actions. The main regulating processes involve observation (acquiring knowledge of the skill to be learned), emulation (using these skills), self-control (internalizing these skills) and self-regulation (using them adaptively).

Thirdly, column three shows how a social cognitive perspective expands the meaning of self-regulated learning. It points out how learners draw on internal regulation related to learning motivation and cognition. In other words, social cognition theory emphasizes the interactive effects of individuals, behavior, and environment. Factors relevant to the individual include the goal, self-efficacy, meta-cognition, strategy knowledge, sense of value, and emotion. Behavior implies self-monitoring, self-judgment, and self-reaction. Environmental factors refer to the characteristics of classrooms or teaching, and academic performance. These three dimensions of self-regulated learning systems go beyond operant conditioning theory's perspective, which emphasizes the behaviorist aspect, instead of the cognition strategies. The main regulated processes are self-observation, self-judgment, and self-reaction.

Finally in column four, information-processing theory, uses metacognition to explain self-regulated learning and indicates that the learner recognizes the learning strategy and how to use it. The main regulating processes are selecting and organizing the information,

rehearsing new knowledge alongside existing information in working memory and employing these learning strategies.

Volition also plays an important role in self-regulated learning. Kuhl (1984) emphasizes that the use of a learning strategy alone is insufficient for achieving the goal in learning processes, and there is a need to incorporate action control for achieving goal realization. Action control involves two types of processes including pre-decision processes and post-decision processes. The former refers to the cognitive activity related to decision making and goal setting (motivation), the latter refers to when the goal setting has been developed and the processing activity has become important for implementing the goal. Pintrich et al. (1993) argued that time and environment management, peer collaborative learning, and resources management are important in self-regulated learning strategies. The way in which teachers actually operationalise self-regulated learning in practice will depend on what cognitive theory they are working within.

2. 6. Cognitive Motivation

Recent social cognitive theory has begun exploring the complex process of cognition related to goal-orientation (goal perspective), self-efficacy, and attribution theory, which are the main theories of cognitive motivation (Roberts, 1992). They are of particular relevance to this study as it is acknowledged that the individual differences of the students who are involved in this study will impact on their involvement with the various learning experience and as such need to be taken into account when interpreting student outcomes.

2. 6. 1. Goal-orientation Theory

Goal-orientation theory holds that individuals' cognition, emotion, and evaluation are a process of motivation, which directs their choice and pursuit of an achievement goal. Achievement goals lead individuals to evaluate many achievement situations and select those that will enable them to achieve their achievement goal. Ames (1984), Dweck (1986) and Nicholls (1984, 1989) explored students' academic performance and stated that the processes of cognition of different behavior goals affect behavior change. Motivation relates strongly to individuals' behavior, as individuals will decide how much effort, time and ability to put in, and this will depend on their behavior goal orientation. There are two types of behavior goal-orientation: ego involvement and task involvement. Task involvement refers to the individual exhibition of ability through self-reference. If the

individual's skill is better than previous, it means they have higher ability and they will perceive more possibility of success. Ego involvement refers to the individual exhibition of ability through other-reference. If the individual's skill exceeds that of other people, it indicates their ability is enhanced and they will perceive more possibility of success. Different kinds of involvement result from the interaction between context and goal perspective. Based on the individual difference of goal perspective, those with task involvement and ego involvement are called task-oriented and ego-oriented respectively. Goal-orientation in physical education has been studied with regard to perceived competence, intrinsic motivation, and sports performance.

A. Goal-orientation and Perceived Competence

Duda (1987, 1992) indicated that individuals with high perceived competence will show high effort and persistence, but those who have an ego-orientation and low perceived competence will soon drop out of sport when faced with a high difficulty goal. For the task-oriented person, whether of high or low perceived competence, they will persist in sports participation and accept the challenge of goals, even when facing high difficulty goals.

Ames & Archer (1988) found that students with a task-orientation goal could use more learning strategies and embrace a wider choice of challenge task. They showed more active learning and believed that as long as they put in the effort, they could make it. This study suggested that students with task-orientation goals developed and maintained their learning motivation more consistently.

Another study by Newsham (1989) reported that when participating for 12 weeks with a task-orientation approach, kindergarten children showed higher-perceived competence than those in a traditional physical education class.

Duda, Chi & Newton (1990) explored the relationship between goal-orientation and perceived competence within a tennis game for university students. These results found that students with a high task-orientation could maintain their perceived competence whatever their result and they did not reduce their perceived competence even after losing a match.

Duda (1992) also pointed out that individuals liked to exhibit high competence and avoid demonstrating low competence, but ego-oriented persons preferred to show their

competence to others by means of social comparison. Further, an ego-oriented person is easily affected by external affairs and their perceived competence lasts for a short period. The implication of this study revealed that individuals with task-orientation are able to focus on the learning process, and put in effort to enhance their mastery leaning and perceived competence whether they are of high or low perceived competence to begin with. Those with ego-orientation and high perceived competence will exhibit their confidence and expectancy of their ability. They will work hard on performance. Those with ego-orientation and low perceived competence, who have a lack of expectancy for success, do not work hard and will produce a poor performance. Therefore, goal-orientation and perceived competence will affect both the individual's emotion and achievement behavior as demonstrated in: effort intensity, task choice, movement performance and persistence of participation.

Scanlan & Simon (1992) indicated that movement enjoyment is part of intrinsic motivation relevant to individuals' persistence in sports participation. In terms of goal-orientation, the individuals' goal-orientation will affect their intrinsic motivation towards achievement movement. Individuals with ego-orientation are more likely to ‘attack’ other persons in order to exhibit their high ability, rather than maintain an inner interest in their work. For individuals with low perceived competence, expectancy of failure will contribute to their feeling bored in their work. In contrast, those with high task-orientation are more likely to enjoy their work irrespective of high or low perceived competence. Xiao (1995) also indicated that individuals with greater task-orientation are more likely to attain enjoyment whereas individuals with greater ego-orientation are less likely to get enjoyment in the movement context. This is an important idea as enjoyment plays an important role in the persistence in movement.

B. Goal-Orientation and Achievement Motivation

Achievement motivation refers to the effort individuals put into the pursuit of a meaningful and valued task. According to achievement motivation theory, persons of different goal orientations will respond differently with regard to achievement motivation. Task-orientation will enhance intrinsic motivation; ego-orientation will reduce the intrinsic motivation. Nicholls (1989) pointed out that the achievement motivation of ego-oriented persons is directed towards demonstrating their excellence or competence. When they fail to reach their goals and demonstrate their competence, this reduces their intrinsic interest

and joy. In contrast, the achievement motivation of task-oriented persons is to work at increasing their self-experience. They put in effort based on intrinsic satisfaction and interest. When they are in a competitive environment, their intrinsic motivation will reduce (Plant & Ryan, 1985). Duda's (1989) comparison of the TEOSQ (Task and Ego-Orientation in Sport Questionnaire) and the IMI intrinsic motivation inventory, confirmed that task-orientation showed a positive correlation with IMI effort, but ego-orientation showed a negative correlation with IMI joy. Standage et al. (2003) examined a model of student motivation in physical education using constructs from self-determination and achievement goal theories to predict physical activity intentions. Their findings indicated that an 'autonomy-supportive' climate and a lesser mastery climate contributed to positive results with regard to autonomy, competence and relatedness. From this study the instructional implication is that instructors should provide more self-determined motivation and less perceptions of a mastery climate, for students to gain more autonomy and competence. Therefore, a supportive learning climate contributes to arousing students' intrinsic motivation.

In short, both theoretical and experimental evidence has shown that ego-orientation is associated with reduced intrinsic motivation and task-orientation is associated with the enhancement of intrinsic motivation.

C. Goal-Orientation and Sports Performance

Locke et al. (1981) suggested that there are four mechanisms in goal setting: direction and focusing individual action, regulated effort level, enhancing persistence and promoting task strategies development. Burton (1989b) examined the effects of a goal setting training program related to swimming players' performance. His results show that the experimental group players' performance was better than that of the control group. Hall (1990) then explored the influences of perceived competence, goal-orientation, and success and failure feedback related to performance. The results showed that the performance of the low perceived competence group with ego-orientation were worse than that of the low perceived competence group with task-orientation. Moreover, the low perceived competence group with ego-orientation showed negative emotional reaction and cognition. This finding not only supports the importance of goal orientation, but also provides further evidence, that achievement motivation will impact on social cognition.

2. 6. 2. Self-efficacy Theory

Bandura has developed the concept of self-efficacy, defined as an individual's perceived competence and judgment with regard to whether they can successfully perform their task in a limited context (Bandura, 1977).

Self-efficacy is a critical concept in social learning and social cognitive theory (Bandura, 1986). In terms of social learning theory, behavior needs to be seen as a mutual outcome of the individual and their environment. The environment can affect the individual, but the individual also is provided with cognition ability, which can actively explain, choose, and influence the environment. Social cognitive theory identifies self-efficacy as a critical concept for explaining this mutual causality. Bandura (1986) indicates that the individual will judge their performance ability through their expectation that they will achieve their goal. In other words, an individual's perceived self-efficacy will be influenced by their beliefs concerning the success of their behavior. Indeed, Bandura proposed that the individual's efficacy expectation will lead to their activity choice, willingness to expend effort, thinking and emotional response and persistence. In addition, the individual's self-evaluation will determine their emotional reaction to the situation and their behavior. In defining the meaning of self-efficacy above, we can note several limiting concepts such as:

A. Self-efficacy is an integrated belief, not just a combination of several abilities.
B. Self-efficacy is associated with an individual environment; therefore, different contexts involve different self-efficacy.
C. Self-efficacy is associated with individual integrated ability in the behavior process.
D. Individuals will regulate their behavior within different environments; therefore, self-efficacy is a mechanism of individual behavior.

Bandura (1977, 1986) pointed out that there are four sources, which are involved in self-efficacy judgments: performance accomplishments, vicarious experience, verbal persuasion, and physiological arousal. Performance accomplishment refers to the experience and the level of task mastery; when individuals have successful experiences, these will enhance their self-efficacy. On the other hand, those with the experience of failure will experience a reduction in their self-efficacy. This kind of information about self-efficacy can be influenced by task difficulty, effort, and the physical condition or task characteristics. Vicarious experience refers to how individuals gain their perceived competence through observing others' behavior. When individuals observe those, with similar ability, achieve

successful performance, this will enhance their self-efficacy. When individuals observe those with similar ability, put in effort and experience failure, this will reduce their self-efficacy. Verbal persuasion refers to when individuals gain support from the social environment such as from teachers, coaches and peers; it also includes verbal explanation, self-talk, imagery and other cognitive strategies. Physiological arousal refers to individual's efficacy evaluation response through their physiological arousal. For example, when individuals' heartbeats, breath, and blood pressure, are raised and they are anxious, this means the individual's self-efficacy is not so high for their task performance. In brief, through appropriate manipulation of these sources, people can be taught to change their own behavior. Clearly, there is a need for educators to know more about self-efficacy so that they can use this knowledge in assisting students to develop more regular physical activity habits.

A. Self-efficacy and Sports Performance

A considerable number of studies have been conducted on self-efficacy related to sports performance and using the promotion of self-efficacy as a means to enhancing sports performance. For example, Feltz, Landers & Reader (1979) reported that an active practice group achieved higher self-efficacy scores than a passive practice (only watching the demonstration and video tape) group. The result supports the relationship between high self-efficacy and high performance. Weinberg et al. (1979, 1980) explored the relationship between self-efficacy and raised foot endurance, the players were face-to-face in the first study, and here it was found that those with high self-efficacy endured a longer time than those with low self-efficacy in a foot raising competition. The players were back-to-back in the second study, and the result was also that the players with high self-efficacy endured for a longer time than those with low self-efficacy.

An alternative view of the management of decision-making in the self-regulated learning process, presented by Kane et al. (1996), indicates three points as follows: (1) Self-efficacy does not really affect sports performance directly. (2) Past performance is the main factor in predicting future performance. (3) Sports performance has a positive interrelationship with satisfaction. These points of view do not conform to Bandura's perspectives (Kao, 1998).

Theodorakis (1995) explored self-efficacy related to satisfaction and individual goals based on goal setting theory and found: (1) Past performance is the main factor in future

performance. (2) Self-efficacy directly or indirectly affects sports performance. If we eliminate the effect of past performance, self-efficacy will affect sports performance through the individual's goal setting. This implication reports that goal setting is a critical factor for sports performance. (3) Sports performance is negatively correlated with satisfaction. Satisfaction will affect sports performance through the goal setting process, as the individual who is dissatisfied at a past performance will set a higher goal for enhancing their next performance. Locke (1996) stated that self-efficacy and goal commitment are the mediating factors between personality and performance. Schunk (1995) indicated that role models and attribution are also factors affecting self-efficacy, goal setting and movement performance.

Bandura & Jourden (1991) indicated that enjoyment and satisfaction are the key factors influencing students to participate in physical activity after taking an activity class. Enjoyment occurs as students become confident about their abilities. Self-efficacy develops from the student's ability to perform an activity with some degree of success (Carleton & Henrich, 2000). Bandura & Cervone (1983) pointed out that dissatisfaction could also drive an individual’s motivation. Regarding self-evaluation of self-regulation, Bandura (1991) suggested that it implies three principles: (1). Individuals consider the effort exerted with regard to the achievement goal. Individuals consider that if they can achieve their goal with effort, they will advance bravely. Otherwise, they will shrink back. (2). Individuals' emotional reaction (satisfaction) supports self-worth in their performance. The criterion of self-evaluation is performance accomplishment. (3). The individual executes a self-evaluation of self-efficacy after a goal has been achieved. Individuals with higher perceived competence experience higher motivation. In contrast, individuals with lower perceived competence experience lower motivation.

On the other hand, Kane et al. (1996) found that individuals have higher satisfaction after achieving their goal and change their goal setting in order to pursue further performance. Cervone et al. (1991) argued that satisfaction can promote self-efficacy in a complicated cognitive task, and lead to putting in more effort to pursue or maintain performance, whereas, dissatisfaction can lead to weaker self-efficacy, and to a reduction of effort and performance. Whether it is satisfaction or dissatisfaction that accounts for individual's motivation for effort, there are some contrasting opinions in the literature. Whether the previous performance has achieved the set goal or not, after performance those with high

self-efficacy will set higher goal for better performance if they are satisfied with their performance; those who have high self-efficacy but are not satisfied with their performance will also work harder to pursue higher goals and performance. Those with low self-efficacy will withdraw from advancing no matter how they have performed. In brief, satisfaction is related to an emotional response to self-evaluation. It is important to identify this factor with other factors to ensure comprehensive understanding.

As identified, we can summarize three points for self-efficacy in sports: (1) self-efficacy's enhancement is based on the information of self-efficacy; (2) self-efficacy is in part a response to successful performance in the sports context; (3) goal setting is a critical mediating factor and can directly influence sports performance.

2. 6. 3. Attribution Theory

A. Basic Attribution Theory

Heider (1958) indicated that individual behavior was the result of the interaction of environment and the individual. He proposed two ways to explore how one perceived self and others' behavioral results: attributing the behavioral result to the person or attributing the behavioral result to the environment. The former can attribute the result to either ability or effort, whereas the latter will attribute the result to either task difficulty or chance. Weiner et al. (1972) pointed out the attribution framework also incorporates two dimensions: stability and locus of control. Ability and task difficulty are stable factors, because they do not change with time. In contrast, effort and chance can be classified as unstable factors. In the locus of control dimension, ability and effort are internal factors, which the individual can control, but task difficulty and chance are external factors. Table 8 summarizes the framework of attribution.

Table8. The framework of attribution (Weiner et al. 1972)

		Locus of control	
		Internal	External
Stability	Stable	ability	task difficulty
	Unstable	effort	chance

Currently sports psychologists are concerned with the study of self-efficacy and causal-

attribution. They hold that the individual receives the external information through the process of self-reference thought to reflect their intentioned behavior as an integrated behaviour. That is, the individual is able to control their self-reference thought, motivation and behavior (McAuley, 1992). Bandura defined self-efficacy as a concept for explaining the mutual causality. Behavior is a mutual outcome of the individual and their environment. The environment can affect the individual, but the individual is also provided with cognition ability, which can actively explain, choose, and influence the environment. Bandura (1986) indicates that an individual's perceived self-efficacy will be influenced by his or her beliefs concerning the success of their behavior. Bandura further distinguished between two kinds of expectancy beliefs: outcome expectations and efficacy expectations. Outcome expectations refer to the belief that certain behaviors will lead to certain outcomes, Efficacy expectations refer to individual trust and doubt as to whether they can effectively perform to the standard or not

Indeed, Bandura has indicated that individual's efficacy expectation is the major determinant factor, which will lead to their goal setting, activity choice, willingness to expend effort, thinking and emotional response and persistence. On the other hand, attribution theory emphasizes that the individual's self-evaluation will determine their emotional reaction to the situation and the required behavior. In other words, individuals interpret their behavior in an achievement task with the use of different information including: social modeling, past experience, causal schemata, achievement needs, reinforcement schedules and different causal dimensions (Weiner, 1985). However, there is a positive interrelationship between attribution and perceived competence as mentioned before. The information can be seen as the common factor between attribution and self-efficacy. That is, individuals employ efficacy expectations to make a judgment associated with pre-behavior information, and construct the view of achievement behavior (e.g. Goal, anxiety, and attribution), that in turn, will lead to their selection of achievement behavior, exertion of effort, and persistence. Ability is also a common and emphasized factor between self-efficacy and attribution.

All in all, self-efficacy plays an important role as a core mechanism in human behavior with regard to achievement motivation (attribution and goal-orientation). Attribution theory suggests that the instructor should try to lead students to attribute failure as an internal and unstable factor in their learning. The students will then believe that failure can be changed.

Self-efficacy theory suggests that the instructor should give students a challenge (with a success rate of 50%) and provide minimal help to assist them overcome a sense of failure and enhance their self-efficacy (Bandura, 1986).

From this study, the implication is that the learning experience provided should support perceived competence for the students, so that they believe that failure is an unstable factor and can be overcome.

B. Experimental Study of Attributions for Success or Failure in Sport

Weiner (1974) stated that the locus of control dimension would lead to reactions of honor and shame for individual success or failure in performance. The stability dimension would affect the individual in organizing their expectation for future performance or success. In their locus of control studies, Bukowske & Moore (1980) explored attributions for success or failure in physical fitness activities in summer camp. They showed that successful persons are more likely to attribute the internal factors (ability and effort) for their success, but unsuccessful persons attribute the external factors (chance and task difficulty) for their failure. Young (1985**)** investigated the attribution of reasons for liking or disliking physical education class and the results found that successful persons are more likely to attribute effort interest, physical condition, and teaching factors than unsuccessful person.

McAuley & Gross (1983) used 62 college students to evaluate the attributions of success or failure in table tennis with the Causal Dimension Scale (CDS). They found that the winners were more likely to identify internal, stable, and controllable factors. Duncan & McAuley (1987) studied 84 university students and explored their attributions related to self-efficacy with the CDS instrument. Their results found no significant difference between high and low self-efficacy with winners more likely to attribute stable and controllable factors. Chase (2001) examined children's self-efficacy, motivational intentions and attributions in physical education and sport. With regard to failure to participate in sports it was found that children with higher self-efficacy attributed failure to lack of effort and had higher future self-efficacy. In contrast, children with lower self-efficacy attributed failure to lack of ability. The implication of this study is that self-efficacy levels influence children's motivational intentions, future self-efficacy beliefs, and attributions in physical education and sport.

When expanding the self-regulation model in sports, there are still a lot of unexplored

behavioral mechanisms to consider in sport self-regulation. Firstly, the relationship between attribution and self-efficacy is one direction for research suggested by many scholars (Duncan & McAuley, 1987; Schunk, 1995; Kane et al., 1996). When successful performance is attributed to one's own skill and ability, the individual's self-efficacy will be enhanced. On the other hand, when failing performance is attributed to one's own poor ability, the individual's self-efficacy will be diminished. Therefore, the attributions for sport performance will strongly affect the individual's self-efficacy. In fact, during the process of self-regulation, self-efficacy will affect attributions, and post-performance attributions will in turn affect new self-efficacy beliefs (McAuley, 1992; Gist & Mitchell, 1992).

Secondly, goal-oriented theory cannot be neglected in expanding the self-regulation model in sports. In self-regulated behavior, those who think ability is changeable will have higher self-efficacy and levels of performance, but those who think ability is fixed and cannot be changed will show lower self-efficacy and levels of performance. Thus it seems to suggest that task-oriented people (those who think ability can be changed) have better self-efficacy and performance in the learning process. Ego-oriented people (those who think ability is fixed and cannot be changed), after knowing the result of their poor performance, will have lower self-efficacy and performance.

Self-efficacy, attribution, and achievement motivation are all significant theories about human cognition motivation. Engaging in cross-theory research will contribute greatly to understanding complex sport behavior. Moreover, within the motivation field, affective processes have not received systematic attention, except in the case of attribution theory. It is worth investigating such processes more systematically.

2. 7. The Importance of Self-regulated Learning for Physical Education

In a competitive society, how to improve the quality of education has been a critical issue. School education has paid attention to "learning what" but has ignored "learning to learn" for a long time. It is important to teach students to become spontaneous learners. As identified, the concept of self-regulated learning focuses on student centered learning practices through systematic efforts and self-regulation. Therefore, this research will explore the effects of using self-regulated learning strategies on college students' performance and satisfaction in physical education.

The fundamental goal of physical education and sport is to educate people to ensure a

balanced development among the qualities of skill, ethics, knowledge, health-related physical fitness, and a sense of togetherness (National Ministry of Education Report, 1995). However, there is a divergence between the intended outcomes and the actual results achieved. For example, the National Ministry of Education in Taiwan (1998) reports a study of K-12 students' participation in physical activities or leisure activities in school and out of school. Only 22.55% of the males and 12.61%of females have exercised in school or out of school. In addition, according to a report from the National Council of Physical Fitness & Sport (White Report, 2000), 15.09% of Taiwanese never take exercise, 80% of Taiwanese do not constantly exercise and 78% of Taiwanese ignore the benefits of regular activity. Moreover, 23% of student's aged 8 to 23 years are obese or overweight. The implications for teachers include: 1.What meanings do students give to the terms "physical education and autonomous learning"? 2. What kind of teacher actions can influence students' view of on-going participation in sports?

Weiss (1993a) pointed out that there are three major motives relating to children and adolescents' participation in physical activity. These are developing physical competence, gaining social acceptance and support and having enjoyment of physical activity. Considerable evidence shows that students who report stronger beliefs about their physical competencies are more likely to engage in activity and sustain interest in continuing involvement than students who report lower levels of physical competence. Horn & Harris (1996) indicate that teachers should offer intervention strategies that will be effective for enhancing physical self-perceptions in children; in particular, creating an environment that will enhance children's perception of their physical competence and help children help themselves by providing them with self-regulation skills. This can lead in turn, to greater enjoyment, self-esteem, motivation and physical activity behavior. Furthermore, Rowland and Freedson (1994) urge that children and youth must develop a lifestyle of regular physical activity for long-term health benefits. In order to reach such a goal, they suggest providing positive experiences and making physical activity enjoyable. Finally, Brustad (1993) argues that parents, teachers and peers through their feedback, reinforcement, modeling, and structuring of opportunities have a strong influence on children's perception of their physical competence, enjoyment of physical activity, self-esteem, motivation, and physical activity behaviors. Greater parental enjoyment and encouragement are associated with higher levels of children's perceived competence and attraction to physical activity. Smith & Smoll (1996) also pointed out that coaches' and teachers' feedback and

reinforcement comprise important informational or evaluative (e. g., praise, criticism) responses to participation and performance. Weiss & Duncan (1992) indicate that children and teenagers who are physically skilled and hold positive beliefs about their abilities tend to be more popular with their peer group.

Huang (1995) indicated that physical education courses for university students should be different from those for high school students and primary school students. Since university students' self-initiative is relatively higher, their needs are no longer for skill training. Instead, they want to learn some activities that they can play in the future. Since the university is the last stage for students to learn sports, physical education instructors should understand students' abilities to fulfill the demands of society and handle the activities relevant to their current life. Therefore, we should examine effectiveness / relevance from three dimensions as below:

A. The learning environment: This should

1. meet students' needs and lead students to experience the characteristic of sports in ways that enhance motivation towards learning.
2. consider individual differences and let students have the opportunity for participating and competing.
3. understand students' abilities and promote movement skills from basic to high level.
4. maximize activity time and build physical fitness.

B. Learning processes: These should create congruent, engaging instructional practices by:

1. having a clear instructional purpose and increasing students' interest in learning.
2. teaching toward learning, not just organizing for participation. Students need to learn movement culture, life skills, and movement skills and abilities through proper progressions. For example, when teaching physical fitness, we need to design physical activity, which takes into account, heart rate, muscle stretch, and health care in or after sports.
3. aiming content selection, rules protocols, and instruction toward spontaneous learning.

C. Self-assessment: Students should revise their movement and check it all the time; Teachers should only give special assistance as a last resort. Students could also design learning materials for reinforcing their motivation towards learning.

According to Article 23 of the Implementation Rules for University Law, universities and independent colleges shall set their own curriculum. Physical education has become an elective course since 1996 in Taiwan. That is, university and independent colleges have the right to decide whether P.E. is required or not. Hence, Chang and Huang (1996) stated that physical education courses in university are compulsory for first to third year students, and optional for the fourth year students. The attitude of teachers and the content of physical education have therefore changed. Instructors have more freedom to design the content and the ways in which they will evaluate students' performance. About 81% of colleges and universities wanted to design and offer leisure sports as their physical education course. The leisure courses are designed according to the professional abilities of instructors, and the needs of students.

Hu (1996) indicated that physical education teachers should confront the 'innovation wave' in physical education courses in colleges and universities in Taiwan and attempt to capitalize on it. He suggested there were three directions in which to promote the innovation successfully: 1. to identify the core goals of physical education, 2. to accommodate the changing needs of our society, lifelong sports should be considered as the main teaching content, 3. to provide more optional items for students to select.

Self-regulated learning is an innovative approach to promote a sense of belonging, and lead students to be involved in self-directed learning. Currently educational psychologists have paid attention to the important of self-regulated learning (Zimmerman & Martinez-Pons, 1986), because it not only can enhance the students' cognitive motivation, but also has significant effect on their general education. However, as mentioned, although many international studies in physical education have focused on motor skill performances, only a limited number of results have been reported relevant to the pedagogy of physical education in Taiwan. Therefore, the researcher attempted to investigate whether using self-regulation supporting strategies could promote college students’ learning and satisfaction in Physical Education. Kao (1998) indicated that there are few reported which have attended to the self-regulated learning of college students in physical education classes in Taiwan. Two studies only, reported below were identified as relevant to self-regulated learning and performance in the sports domain.

Nietfeld (2003) investigated metacognitive strategy use and monitoring skills by

competitive middle distance runners. He found that there was a correlation between strategy use and performance with participants who reported being more strategic being more accurate in monitoring their pace on a performance task. Su (2002) investigated the impact on the performance of table tennis of students' self-monitoring and teacher's monitoring. Results found that teacher's monitoring scored better than student's self-monitoring for the serve of table tennis. In addition, teacher's monitoring had a significant effect on goal setting and self-efficacy whereas students' self-monitoring did not have an effect on goal setting and self-efficacy. The implication from this study is that the instructor should provide feedback to students to facilitate their self-monitoring and goal setting in the preparation phrase. When students become familiar with self-regulated learning strategies instructors only then can 'remove the scaffolding'.

2. 8. A Summary of the Review of Literature

In summary, self-regulated learning has become an important topic in the study of human learning, given that contemporary education and psychologists in education are concerned that learners should be actively involved in the process of learning instead of experiencing passive learning (Chen, 2002; Pintrich, 2000; Tsujino, 1991; Zimmerman & Martinez-Pons, 1986). Various self-regulated learning theories have been advanced, and each has important implications for implementation. However, there is no consensus with regard to implementing practice. The way in which teachers actually implement self-regulated learning will depend on what cognitive theory they are working within.

In the domain of physical education, physical inactivity contributes to significant negative health consequences and this has been an important global issue. The results indicate that lacking regular physical activity means that future social elites will lose their basic health at a young age in Taiwan (Zhuo, 1999). Therefore, how to strengthen physical fitness and the ability to independently practice physical activities has become a major concern. For physical educational instructors, the priority of curriculum reform is to meet the society's needs and also implement effective intervention strategies. Self-regulated learning and teaching seems likely to provide a way of motivating students to continue in physical activity and, later on, to participate in sports enthusiastically.

As identified, self-regulated learning is an integrated learning process, which occurs when individuals attempt to adjust the characteristics of their own behavior, motivation and

cognition to best suit their own learning. It is most important that both control and goal setting come from within the student and are not externally imposed. Garcia (1995) indicated that self-regulated learning brings together the learner's will and skill. Will refers to the learner's motivational orientation of goal, value, and expectation. Skill refers to the learner using different cognitive, meta-cognitive, and resource management strategies. Shunk (1996) has argued that the self-regulated learning process involves motivation (self-instruction, attribution, achievement motivation, and task value) and cognition activities (meta-cognition, self-monitor, and self-evaluation).

Therefore, self-regulated learning views students as active seekers and processors of information. Instructors should be aware of the powerful roles of perceived competence, enjoyment and social support in motivation. The purpose of education is for students to be able to assess their environment and then experiment with positive ways in which to improve it. The physical education instructor may be able to use self-regulated learning strategies in order to promote spontaneous learning and provide a learning-to-learn environment, because negative behavior patterns, once they are established, become very difficult to change. Hence, we need to help students learn to be active early in their lives. This will provide an important foundation for sustaining participation in physical activity.

Chapter three (Theoretical Framework) will discuss the framework within which this study has been conceptualized.

CHAPTER THREE

Theoretical Framework

This study is an intervention study conducted to investigate the effects of using self-regulated learning strategies on college students' performance and satisfaction in physical education. Self-regulated learning is an integrated learning process in which learners control their motivation, cognition and behaviour. It includes two sub-processes: motivational beliefs and strategy use. Garcia (1995) indicated that self-regulated learning brings together the learner's will and skill. Will refers to the learner's motivational orientation of goal, value, and expectation. Skill refers to the learner using different cognitive, meta-cognitive, and resource management strategies. This study has adopted a social cognitive framework as the basis for operationalizing self-regulated learning (Nahas et al. 2003; Ommundsen, 2003). Therefore, the researcher has attempted to implement a self-regulated learning model in sport incorporating cognitive motivation theory (goal-orientation, self-efficacy, and attribution theory) and teaching strategies use.

The conceptual framework adopted begins with the teaching strategies used in this study. The second section focuses on identifying the operational differences between the strategies. The third section highlights the individual differences in student entry characteristics, which impact on learning. This leads to the presentation of the conceptual model for the study and the research hypotheses.

3. 1. Self-regulated Teaching Strategies

Strategy use is the core of self-regulated learning. In terms of strategies used, Bandura (1986) pointed out that self-regulated learning involves three sub-processes: self-observation or self-monitoring, self-judgment, and self-reaction, which are connected with each other. Thus self-regulation in Bandura's (1986, 1991) work is best seen as a mutually related cause and effect of behaviour, cognition, and environment.

Zimmerman and Martinez-Pons (1986) identified 14 self-regulated learning strategies (see Table 9 below).

Table 9: Self-regulated learning strategies (after, Zimmerman & Martinez-Pons, 1986).

Categories of Strategies	Definitions
1. Self-evaluation	Statements indicating student-initiated evaluation of the quality or progress of their work.
2. Organising and transforming	Statements indicating student-initiated overt or covert rearrangements of instructional materials to improve learning.
3. Goal-seeking and planning	Statements indicating student setting of educational goals, or subgoals and planning for sequencing, timing, and completing activities related to those goals.
4. Seeking information	Statements indicating student-initiated efforts to secure further task information from nonsocial sources when undertaking an assignment.
5. Keeping records and monitoring	Statements indicating student-initiated efforts to record events or results.
6. Environmental structuring	Statements indicating student-initiated efforts to select or arrange the physical setting to make learning easier.
7. Self-consequences	Statements indicating student-initiated efforts to imagine of rewards or punishment for success or failure.
8. Rehearsing and memorizing	Statements indicating student-initiated efforts to memorize material by overt or covert practice.
9-11. Seeking social assistance	Statements indicating student-initiated efforts to solicit help from peers (9), teachers (10), and adults (11).
12-14. Reviewing records	Statements indicating student-initiated efforts to reread tests (12), notes (13), or textbooks (14) to prepare for class or further testing.
15. Other	Statements indicating learning behavior that is initiated by other persons such as teacher or parents, and all unclear verbal responses.

From an information-processing theory perspective, the meta-cognition approach is used to explain self- regulated learning. It indicates that the learner recognises the learning strategy (including analysis, planning, implementation, monitoring and modification) and how to use it (Schunk, 1996). From the volition theory perspective, Pintrich et al. (1993) have argued that time and environment management, peer collaborative learning, and resources management are also important in self-regulated learning strategies. However, there is no consensus with regard to self-regulated learning theories; the way in which self-regulated learning is implemented will depend on what cognitive theory is being worked within. The present study will examine the selective development of self-regulated learning through the processes of goal setting, self- monitoring, self-evaluation, self-reinforcement, and resource

management.

1.1. Goal Setting

Locke (1968) first developed goal-setting theory to indicate that individuals attempt to achieve routine work based on a perceived goal to regulate action. Thus, goal setting drives an individual's behaviour to performance. Once individuals determine their goal, they motivate themselves to achieve the intended goals. In terms of social cognitive theory, goal setting is a prerequisite for self-regulation. It is also a foundation for self-monitoring and self-evaluation. In addition, in self-regulation processes, behaviours are influenced by long- and short-term, important and non-important, easy and difficult goals. These are prioritised and strategically implemented according to individual aims (Kane, Marks, Zaccaro, & Blair, 1996). Zimmerman et al. (1997) studied developmental phases in self-regulation on the effects of goal setting and self-monitoring in dart-throwing skill with 90 high school girls. The results found that girls who shifted goals developmentally from process to outcome goals fared better than classmates who used only process goals and girls who adhered to only process goals surpassed classmates who used only outcome goals. They also found that using a monitoring sheet could enhance dart-throwing skill, self-efficacy, and self-reaction beliefs. These results suggested that students who set self-paced goals and refined their strategies could enhance their motivation beliefs. Therefore, teachers need to employ strategies and incentives for motivating student learning behaviour towards the desired goals.

There are several characteristics related to effective goal setting, which should be considered (Gould, 1983). 1. Before setting long-term goals, one should set short-term goals for step-by-step attainment. 2. One should set difficult but attainable goals. 3. One should set goals that are measurable. 4. There is a need to write down goal plans or strategies. 5. This enables learners to check and evaluate the effectiveness of their goal-setting plan. If the different levels of acceptance of goals are compared, they would rank in order as self-set goals, participative set goals, and assigned goals. Moreover, Locke & Latham (1985) presented ten hypotheses to identify that performance in an organisational context is similar with that in sport. The specific hypotheses were as follows:

1. Specific goals will regulate action more precisely than general goals.
2. For quantitative (specific) goals, the higher the goal the better the performance, assuming sufficient ability and commitment.
3. Specific, difficult goals will lead to better performance than goals of do-your- best or no

goals.

4. Using short-term goals plus long-term goals will lead to better performance than using long-term goals alone.
5. Goals will affect performance by directing activity, mobilising effort, increasing persistence and motivating the search for appropriate task strategies.
6. Goal setting will be most effective, if not only effective, when there is feedback-showing degree of progress in relation to the goal.
7. With goals that are difficult, the higher the degree of commitment the better the performance.
8. Commitment can be affected by asking the individual to accept the goal, showing support, allowing participation in the setting of the goal, training, team selection and providing athletes with incentives and rewards for specific levels of achievement.
9. Goal attainment will be facilitated by a suitable plan of action or strategy, especially when the task is complex or long term.
10. Competition will improve performance to the degree that it leads to the setting of higher goals and / or increases in goal commitment.

Austin (1989) believed that self-set goals are more readily accepted by the performer and they are more likely to work harder to achieve them. Hollenbeck & Brief (1987) stated that self-set goals are more likely to be affected by individual differences. Performers with higher levels of achievement motivation may set higher goals than those with lower levels of achievement motivation.

According to cognitive evaluation theory, intrinsic motivation builds on self-determination and feelings of competence. In addition, further studies state that there are two functions: control and information. Control refers to when individuals have no chance to choose how to do it. On the other hand, information refers to when individuals are provided with some information related to their competence. If it is positive information, it could promote individuals' competence. Alternatively, if it is negative information, it could reduce individuals' competence. When individuals cannot self-determine, they will feel controlled, and this will reduce their intrinsic motivation (Deci & Ryan, 1980). In terms of failure in goal setting, Locke et al. (1981) and Weinberg et al. (1985) indicated that competition is the main reason for faulty goal setting because subjects are more likely to compare themselves with one another than the standard incorporated with in the goal. As a result, teachers need

to create learning environments, which focus on specific, acceptable, attainable learning goals and positive feedback, instead of on competitive activities.

1.2. Self-monitoring

Zaichkowsky (1984) indicated that once goal setting ability has been established, the ability to self-monitor becomes essential as the ability to pay attention to the internal cues (thoughts, feelings, and sensations) and the external cues (somatic movement and environment) becomes critical in learning. Singer et al. (1991) stated that those with different attention style respond differentially to the degree of internal and external distraction, and performance in any given task is related to the degree of conscious and automatic control (Hardy, Mullen & Jones, 1996). These implications suggest that goal setting plays an important role in the cognition process and attention styles mediate the self-monitoring process. If individuals are not able to consciously self-monitor, their goal setting may not be helpful. In addition, Schunk (1997) cited three implications for self-monitoring by students. 1. Self-monitoring was a critical element for self-reflective practice. 2. Students needed training in self-monitoring and its appropriate use. 3. Teachers needed to design learning environments that included student understanding of their progress. Zimmerman (2000) indicated that three factors could influence self-monitoring: 1. Students must provide self-feedback. 2. Students' feedback must be informative. 3. Students must observe their performance for accuracy.

In conclusion, as mentioned in goal setting theory, teachers need to help students set their learning goals and provide feedback on performance. In this study, the researcher used self-paced goals and a monitor sheet to help students' feedback (self-evaluation and self-reflection) in tennis classes. However, all the participants were beginning learners, so it was also necessary to provide other feedback from the instructor such as modeling, encouragement, task and strategic analysis, outcome checking and strategy refinement (Zimmerman et al., 1996).

1.3. Self-evaluation

Self-evaluation occurs when comparing an individual's current performance with the goal that has been established. It can be influenced by the self-evaluation criterion, the goal characteristics, goal importance and attribution. Self-evaluation criterion means that one’s goal can be achieved based on absolute or normative standards. Goal characteristics refer to

the notion that the goal could enhance learning motivation and self-efficacy. However, individuals must provide the goal commitment. Otherwise, a goal cannot enhance academic performances. Teachers should help students set beneficial goals and build a sense of goal commitment. By goal commitment is meant the level of an individuals' concern with their goal and the degree of intention to improve their performance. Attribution can influence self-efficacy, motivation, achievement, and emotional reaction. Those who attribute lack of success to lack of ability will reduce their internal motivation. In contrast, those who attribute lack of success to insufficient effort or inappropriate strategy will increase their internal motivation. Teachers also need to provide attributional feedback for promoting students' self-regulated learning (Bandura, 1986).

1.4. Self-reinforcement

Bandura (1986) pointed out that self- regulated learning involves three sub-processes: self-observation or self-monitoring, self-judgment, and self-reaction. These are connected with each other. In fact, self-reinforcement is similar to the idea of self-reaction. Self-reaction focuses on personal and environmental encouragement. Personal encouragement merges with personal progress, and then with the satisfaction of achieving a goal to improve self-efficacy and to sustain motivation. Environmental encouragement occurs when students perceive the learning environment as non-threatening to their self-esteem and this can lead to improved learning.

1.5. Resource Management

Kuhl (1984) emphasised that the use of a learning strategy alone was insufficient for achieving goals in the learning processes and there was a need to incorporate action control for the successful realisation of goals. Pintrich et al. (1993) argued that time and environment management, peer collaborative learning and seeking help are important self-regulated learning strategies. In this study, the researcher has focused on improving student collaborative learning.

Butler & Newman (1995) investigated 80 sixth grade students' help seeking behaviours and the influence of ego and task goals. Their results indicated that teaching by using task goals encouraged more students to seek help than by using ego goals. Teaching students self-regulated strategies such as goal setting and self-monitoring, could enhance their perceptions of competence and allow them to adopt self-referenced standards which in turn

translate to greater enjoyment, higher levels of motivation, and increased physical activity behaviour. It can be seen that self-regulation implies two processes: cognitive strategies and volitional strategies. The curriculum for developing those processes focuses on the value orientation of self- actualisation, emphasising the learning of self-management and decision-making. Therefore, it is a student-centred learning style. Teachers are creators of the learning environment, which enables students to develop self-accountability behaviour directly. Teachers offer help and feedback dependent on the students' needs.

Comparison of Traditional Teaching Strategies and Self-regulated Teaching Strategies

In terms of the traditional teaching strategies, Chang (1998) indicated that based on personal experience and observation, physical educational curricula favour the value orientation of disciplinary mastery, which focuses on the learning of movement skills. The curricula of the movement analysis process is a teacher-centred teaching style, where the teachers play a critical role in the learning process, that is, when students practice some movement or skills and the teachers ask what the correct movement is and how to achieve the goal. Therefore, typical teaching behaviours used are demonstration and interpretation strategies to provide instructional information. Students' typical learning behaviour is imitation and listening attentively. Zhau (1997) indicated that the ways to formulate the traditional /directed teaching plans include: (1) Teachers try to have students learn a skill, strategy, or concept. (2) Teachers provide the resources of instructional information to students, using demonstration and interpretation such as preparing instruction/ explain instructional cues, and feedback / refining perspectives. (3) Verbal instruction should be clear, brief, and cover the key factors. (4) Demonstration should provide the template for mastery. (5) Teachers should provide the practising sequence and feedback when the skill is performed. (6) Instructional information should be conveyed directly.

Fang (1998) cited Siedentop's (1992) principles of effective teaching, which pointed out the relationship between traditional and effective teaching included (1) assuring the students' security, (2) clear statements as explanations, (3) aggressive and active monitoring of the students' practising, (4) using a group orientation toward students' behaviour feedback, (5) effectively monitoring students' progress. Therefore, traditional teaching style highlights strategies such as demonstration, interpretation, monitoring, feedback and teacher's ability of verbal expression. In brief, Table 10 shows the differences between the traditional teaching style and self-regulated teaching style in this study as follows:

Table 10. Traditional teaching style and self-regulated teaching style (Fang, 1998, pp.139-170).

Group	Control Group	Experimental Group
Learning experience	Traditional teaching style	Self-regulated teaching style
Characteristic	Teacher-centered	Student-centered
Task	Whole class	Grouping
Plan	Whole class	Grouping
Assessment	Standard-reference	Self-reference
Teaching style	Demonstration and interpretation(teacher-centered)	Feedback, monitor and advice (student-centered)
Learning style	Imitation and attention (passive learning)	Cognition, metacognition and motivation (active learning)
Interaction	Teacher to whole class	Teacher to some student and student to student
Learning environment	Whole class, Pre-impact, Teacher	Grouping, Pre-impact, Student
Decision making	Impact, Teacher, Post-impact, Teacher	Impact, Student, Post-impact Student
Process	PreM DM PostM	PreM DM PostM
Week	1st-4th 5th-15th 16th-17th	1st-4th 5th-15th 16th-17th
Lessons	Demonstration/ Practice/ Refining	SE/M, GS/SP, SI/M MS,OM/R

Ps: Pre M=pre-module. D M=during module. Post M=post module. SE/M= Self-evaluation and monitoring. G S/S P= Goal setting and strategy planning.
SI/M= Strategy implementation and monitoring. O M/ R= Strategy outcome monitoring and refinement of plan

3. 2. Operationalising the Self-regulated Strategies

Although the self-regulated learning oriented teaching model has been developed in an ongoing manner within the classroom, there has been no reported model applied with in the physical education context. This study will adopt a circular model of self-regulated learning developed by Zimmerman, Bonner & Kovach, (1996), as outlined in figure 1:

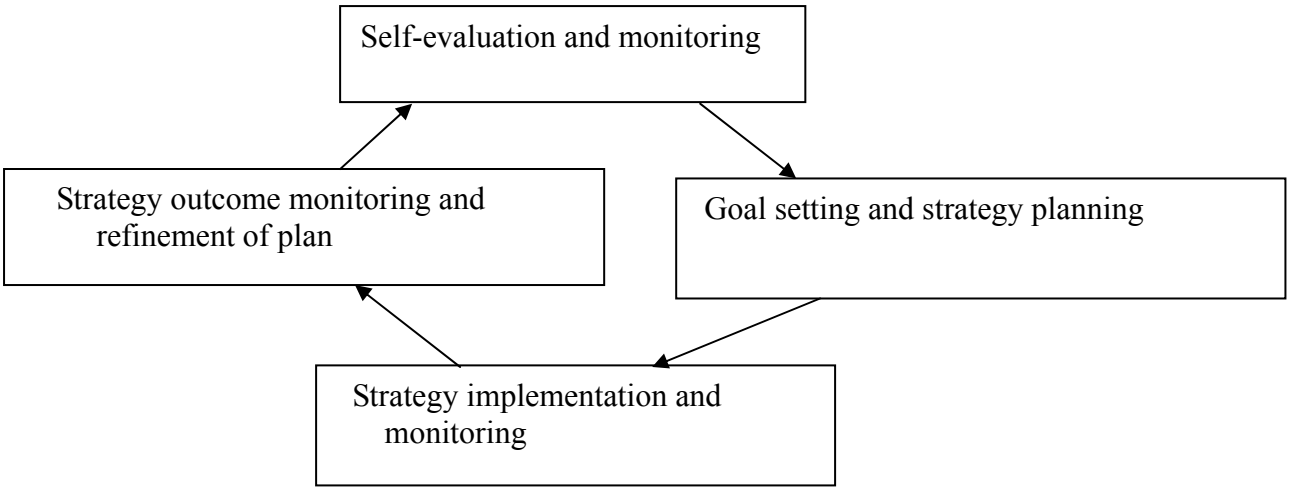

Figure1. The circular model of self-regulated learning (Zimmerman et al. 1996).

This will be operationalised as follows:

3. 1. *Self-evaluation and monitoring: the instructor focuses on facilitating students' awareness*.

(1) The teacher explains the importance of self-regulated learning and strategy use.

(2) The teacher distributes the self-monitoring sheet and teaches students how to fill it in.

(3) The teacher provides the opportunities for evaluating the effects of strategy use.

(4) The students evaluate one another and note the reflections within the group.

(5) The teacher encourages students to seek help if necessary and checks the self-monitoring sheet.

3. 2. *Goal-setting and strategy planning: students determine their goals in learning.*

(1) Students take a small test; the teacher helps students to understand their strengths and weakness.

(2) The teacher helps students to set realistic and short-term goals.

(3) The teacher provides the other learning strategies with goals.

(4) The teacher encourages students to refine their previous learning strategies.

3. 3. *Strategies implementation and monitoring: students apply new information about themselves in learning processes.*

(1) The teacher has students evaluate the effects of using strategies through a test.

(2) The teacher provides the other learning strategies with goals.
(3) The teacher supports students to refine their previous learning strategies.

3. 4. *Strategy outcome monitoring and refinement: students participate in their own learning by confirming the best ways of learning.*

(1) The teacher encourages students to identify the most effective learning strategies.
(2) The teacher has students evaluate the effects of using strategies through a final test.
(3) The teacher helps students to sum up the self- regulated learning processes and reflect on each step including their progression, difficulties, feelings of self-efficacy and enjoyment.

Zimmerman et al. (1996) suggested that apart from guiding the students through the circular model of self-regulated learning, teachers also could provide additional personal support through actions such as modeling, encouragement, task and strategic analysis, outcome checking and strategy refinement. On account of these being beginning learners, the researcher considered that this feedback can be treated as teacher's monitoring. After students are familiar with their movement skill, the instructors can remove 'the scaffoldings' to enable students to achieve a shift to self-monitoring. Table 11 summarises the strategies used in the control (traditional) and experimental (self-regulated learning) groups.

Table11. Comparison of teaching/learning strategies used in the study.

Control group (Traditional strategies)	**Experimental group** (Self-regulated learning strategies)
Informing (information and cue), demonstration, interpretation, practice, feedback.	Strategy use (self-evaluation, goal-setting, self-monitor, self-reinforcement, seeking help), practice, collaborative learning, feedback.

3. 3. Accounting for Individual Differences in Student Entry Characteristics

In educational research, a mediating paradigm has been widely used to understand student participation in classes (Wittrock, 1986). The mediating paradigm recognises that students hold different self-perceptions of their own abilities, afford different meanings to the achievement goals and provide varying explanations for the success and failure of the learning processes associated with their teaching/learning interaction. This review of the literature has identified a number of learner characteristics that have been found to be particularly important from a social cognitive perspective, namely, self-efficacy, attribution and goal orientation.

Self-efficacy is a concept derived from social cognitive theory (Bandura, 1986) that encourages individuals to change their own behaviour, believe in their ability to control their own lives and hence achieve the goal of increasing sport or exercise participation. Bandura (1991) indicated that self-perception of ability determines, in part, the individual's future behaviour and their self-regulation processes. An individual's ideas, feelings, motivation, and behaviour are all affected by their self-efficacy. The explanation is that there is some cognitive evaluation of the situation and the individual's abilities, which leads to an expectancy of success or a demonstration of some desirable characteristics within a particular situation. In this way the mechanism of self-efficacy plays an important role in our lives. While there is considerable evidence which shows that students who report stronger beliefs about their physical competencies are more likely to engage in activity and sustain interest in continuing involvement than students who report lower levels of physical competence (Weiss, 1993). Graham (1995) also suggested that what students believe, think and feel can affect not only their understanding of the subject which is being taught, but also the behaviour which is learned in the classes.

In addition to self-perception of ability, attribution of causal success and failure in learning is a factor that influences students' motivation and perseverance in learning different school subjects (Wittrock, 1986). Attribution is a related area of research, which has also been identified as relevant in many previous studies (Duncan & McAuley, 1987; Kane et al., 1996). For example, when successful performance is attributed to his/her skill and ability, the individuals' self-efficacy will be enhanced. Similarly, when failing performance is attributed to his/her inability, the individuals' self-efficacy will be diminished. Therefore, the attributions of success or failure in sport performance will strongly affect the

individual's self-efficacy. During the processes of self-regulation-self-efficacy and post-performance attribution will in turn affect new self-efficacy beliefs (Kao, 1998). In addition, students' goals for learning cannot be neglected. In self-regulated behavior, those who think ability is changeable will have better self-efficacy and performance. However, those who think ability is fixed and cannot be changed will show lower self-efficacy and performance. Duda (1992) also indicated that individuals with task orientation liked to exhibit high competence and avoid demonstrating low competence, but ego oriented persons with social comparison is easily affected by external affairs and their perceived competence lasts for a short period.

In conclusion, self-efficacy, attribution, and achievement goal orientation are all useful theories about human cognition and motivation that will impact upon student responses to different learning strategies.

3. 4. Conceptual Framework for the Study

The conceptual framework for this study includes the independent variables of teaching strategy, mediating variables (students' characteristics), and dependent variables (satisfaction and performance). The experimental study is conducted within this framework, and involves three surveys (student characteristics, analysis of the learning experience, and satisfaction) and the content test. One hundred students were placed into two tennis classes. Figure 2 represents the model that serves as the conceptual framework for this research.

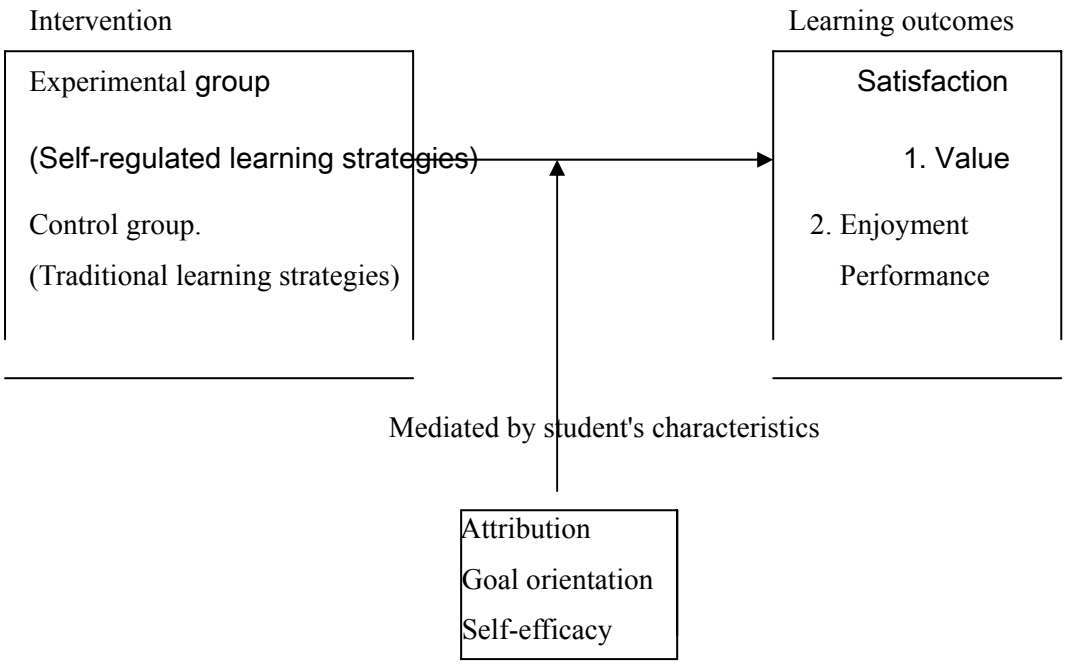

Figure 2. The conceptual framework of the study

3. 5. Research Questions and Hypotheses

Within this conceptual framework, two general research questions were posed.

Firstly, how do the control group and the experimental group differ in terms of the way students experience learning?

The first general research question identified the pre-requisite condition that the two groups were indeed perceived as significantly different in terms of self-regulated learning strategies instruction within the five relevant dimensions of student learning experiences.

Secondly, what are the differences that can be observed between the control group and the experimental group in terms of student outcomes and how are these mediated by the student chacteristics.

The conceptual model identified student characteristics as important mediating variables, which will influence the learning experiences and their impact on the learning outcomes. Therefore, these were identified as covariate variables (task difficulty, effort, ability, ego orientation, task orientation, managing environment change, problem solving) in the analyses. Thus the following hypotheses were tested.

H1. The self-regulated learning group will show higher levels of satisfaction in tennis than the curriculum instructional group after taking into account the entry characteristics of the students involved.

H1-1. The self-regulated learning group will show higher levels of satisfaction through valuing the tennis unit than the curriculum instructional group after taking into account the entry characteristics of the students involved.

H1-2. The self-regulated learning group will show higher levels of satisfaction through enjoyment of the tennis unit than the curriculum instructional group after taking into account the entry characteristics of the students involved.

H2. There will be no difference in tennis performance between the self-regulated learning group and the curriculum instructional group after taking into account the entry characteristics of the students involved.

CHAPTER FOUR

Methodology

This methodology chapter is divided into seven sections. The first section describes the participants. The second section reports the ethical approval process. The third describes the procedures by which the data were gathered. The fourth section describes the experimental design and study variables. The fifth section reports on the development of the data gathering instruments. The sixth section reports the validation and revision of the questionnaires used in this study. The seventh presents the details of the data analysis employed.

4. 1. Study Participants

The population for this study was restricted to college students in Tainan city, Taiwan. All participants comprised Bachelor of Nursing students (age from19 to 20 years) participating in an elective unit of tennis (N=100). Students were divided into two groups for the twenty hours of this physical education module. Group one, the experimental group, was taught by means of strategies to develop self-regulated learning. Group two, the control group, was taught by means of traditional strategies, which followed a teacher centred instructional methodology. Subjects were assigned randomly to one of the two groups.

4. 2. Ethics Approval

The study was reviewed and approved by the Australian Catholic University Human Research Ethics Committee before the commencement of data collection. Completion of the three questionnaires signified the participant's consent to participate in the survey. It was explained to the participants that they could leave the survey at any time and participation would cease at that moment.

4. 3. Procedures of Data Gathering

The data were collected over ten weeks from week five to week fifteen excepting week nine (term examination). A total of three questionnaires were administered in order to collect data concerning students' entry characteristics, the learning experiences, and student satisfaction (see Appendix A, C, and E). The students also participated in a common skill assessment in the last two weeks of the unit. The outline of the project and the schedule for

the collection of data were explained to participants in week one. Students were required to complete the student characteristics questionnaire in the 2nd week. During the module, students were asked to record the monitoring sheet and students from both groups were asked to respond to the learning experience questionnaire. At the conclusion of the module, students were required to take the tennis skill test as part of their course requirement and were asked to complete the student satisfaction questionnaire.

4. 4. Experimental Design and Study Variables

The instructional design was quasi-experimental. The variables of this study were derived from the conceptual framework presented in Chapter Three. They were:

(1.) Independent variables: 1.traditional instruction. 2. self-regulated learning instruction.

(2.) Mediating variables: student characteristics (attributions, goal orientation, and self-efficacy).

(3.) Dependent variables: satisfaction (satisfaction through valuing, satisfaction through enjoyment) and performance (skill test).

The timeline for the implementation was as Table 12 shows:

1.There were 2 hours of PE lessons per week with each group.

2. In the first 4 weeks, both the experimental group and the control group were taught as usual; each student in both groups was required to respond to the student characteristics questionnaire in the 2nd week.

3. From the 5th until the 15th week, the PE researcher taught self-regulated learning strategies with the experimental group and continued to teach traditional teaching strategies with the control group; students in both groups responded to the learning experience questionnaire.

4. In the 16th and 17th week, students in both groups were required to take the tennis skill test and were asked to respond to the satisfaction questionnaire.

The teaching timeframe for the instruction of the various strategies was as follows:

1st stage: Self-evaluation and monitoring (week five to week six)

2nd stage: Goal-setting and strategy planning (week seven to week eight)

3rd stage: Strategy implementation and monitoring (week nine to fifteen)

4th stage: Strategy outcome monitoring and refinement (week sixteen to seventeen).

Table 12. Summary of the timeline for the implementation and data collection.

Experimental group			
Process	Pre-module	During module	Post-Module
Week	1^{st}-4^{th}	5^{th}-15^{th}	16^{th}-17^{th}
Lessons	Preparation	Self-regulated teaching	Tennis skill test
Control group			
Process	Pre-module	During module	Post-Module
Week	1^{st}-4^{th}	5^{th}-15^{th}	16^{th}-17^{th}
Lessons	Preparation	Traditional teaching	Tennis skill test

In addition, there were several additional points that should be noticed:

1.) In the introduction, the researcher used videotapes of tennis learning to bring out students' intrinsic motivation in the first period of the tennis class

2.) The researcher elaborated on the concept of self-regulated learning and strategies application in the second period of the tennis class. In the meantime, the researcher demonstrated how to use the monitoring sheet.

3.) Students were placed into four groups. Each group had a leader who took the responsibility for conveying the information (lesson's goals), which was given by the researcher.

4.) Students filled out a monitoring sheet for each lesson to get used to using self-regulated learning strategies and were graded in terms of their recording of the monitoring sheet and the final tennis content test.

5.) Students filled out the satisfaction questionnaire after the final tennis content test.

4. 5. Development of Questionnaire and Monitoring Sheets

Some of the sources of the questionnaire's items were existing instruments from the literature. Some items were created to meet the needs of this study after consulting with specialists. All items were based on the theoretical framework. In order to validate both the items and the scales and to account for possible language and cultural differences that might be present in the processes of translation and interpretation the following procedures were adopted. Firstly, an item analysis was undertaken to eliminate those items, which did not provide appropriate discrimination between the subjects. Secondly, a factor analysis

was undertaken to assess the relative contribution made by each item to the constructs making up the scale. Finally, a Cronbach's alpha was conducted to assess the internal consistency (reliability) of the items. Only those items that discriminated successfully, loaded significantly on the underlying factors and showed adequate reliability were retained for the final analysis. The item scoring of each scale used a consistent four-point Likert Scale (1=strongly agree, 2=agree, 3=disagree, 4=strongly disagree), except for the global satisfaction item questionnaire, which used a ten-point scale (ranging from1=totally dissatisfied to 10=totally satisfied).

In total, three questionnaires one each for student characteristics, learning experiences, and satisfaction (see Appendix A, C, and E) were administered prior to the start of the module, during the module and at the conclusion of the module.

4. 5. 1. Students' Characteristics

This instrument included 47 items, which comprised three separate scales (Appendix A) to measure attributions for physical education learning (item1 to14), goal orientation (item 15 to 30) and self-efficacy (item 31 to 47). The attributions for success or failure in physical education learning scale was developed based on the Physical Education Learning Environment Scale (Mitchell, 1996), physical education scholars' and the researcher's experience. Mitchell's Physical Education Learning Environment Scale consisted of 4 subscales. The reported internal consistency (alpha= .71, .71, and .75) was good except for the subscale of perceived internal control, which had low reliability and validity. Thus, the researcher adapted three subscales only: task difficulty, ability, and effort for use in this study. The final scale contained 14 items as shown in table 13.

Table 13. Attributions in learning questionnaire used in this study (Three subscales 14 items).

Dimension	Items
Task difficulty	1. I practice hard in physical education class.
	5. In physical education classes I am often asked to do my best.
	7. I can easily achieve the goals set by the teacher.
	10. I feel that I work hard in physical education.
	13. I feel PE can encourage me to challenge my ability.
	14 I do not need to work hard in physical education classes.
Ability	2. I will work harder than other classmates in this class.
	4. I would like to learn as much as possible.
	8. I expect to sweat a lot in this course.
	11. I feel each of my classmates tries to get the better of others.
Effort	3. I feel useless in the physical education classes.
	6. Physical education makes me feel capable.
	9. I get worried that I will look silly in physical education.
	12. Physical education makes me feel bad about myself.

Duda (1989) designed the task and ego orientation in sport scale. The Task and Ego Orientation in Sport scale has been developed with good reported internal consistency (alpha= .81-.86 and .79-.94). The goal orientation scale contained 16 items and these are shown in table 14.

Table 14. Goal orientation questionnaire used in this study (Two subscales 16 items).

Dimension	Items
Task	1. I can keep practising hard.
	2. I get the knack of doing a new skill.
	3. I do something I could not do before.
	4. I learn a new skill by trying hard.
	5. I work really hard.
	6. Something I learn makes me want to practice more.
	7. A skill I learn really feels right.
	8. I do my very best.
Ego	9. I am the only one who can do a play or skill.
	10. I can do better than my friends.
	11. The others cannot do as well as me.
	12. Others mess-up and I do not.
	13. I beat the others.
	14. I have the highest score.
	15. I am the best.
	16. I am more skilled than other people.

Finally, the general self-efficacy scale was designed by Sherer & Maddux (1982) and adapted by Huang & Cheng (1995). The General Self-efficacy Scale has reported acceptable validity (coefficient .712). The self-efficacy questionnaire used in this study contains 17 items and is shown in table 15.

Table 15. Self-efficacy questionnaire used in this study (Three subscales 17 items).

Dimension	Items
Goal achievement	1. I cannot concentrate on the work when I have to.
	2. When I encounter something I cannot handle, I keep trying until it is done.
	3. I seldom achieve the important objectives I set for myself.
	4. After making a plan, I can carry it out.
	5. I usually give up before things are done.
	8. Even if I do not like something, I would persist to finish it.
	9. When I have decided to do something, I will do it right away.
Problem solving	7. If things look complicated, I will not give it a try at all.
	11. I cannot deal properly with unexpected problems.
	13. Failure can make me work harder.
	14. I am not confident in my capability.
	15. I am independent.
	17. I seem to be incapable of handing most problems in my life.
Managing environmental change	6. I avoid facing difficulties.
	10. When I learn something new, if it does not go smoothly at the beginning, I will give it up very soon.
	12. When new things look difficult, I would avoid learning them.
	16. When encountering difficulties, I will give up easily.

4. 5 .2. Monitoring sheet.

The monitoring sheet was a distinctive feature of the experimental group's learning experience. Members of the experimental group recorded monitoring sheets after finishing each tennis class to provide a basis for self-evaluation and reflection. The design of the

monitoring sheet was based on the self-regulated learning strategies of goal setting, self-monitoring, self-evaluation, self-reinforcement, and seeking help (see Appendix G) and adapted from Yano and Tatsugi (1985). The monitoring sheets provided a source of qualitative data to evaluate how students were following the processes of self-regulated learning, for example the students' goal setting and their progress with self-improvement goals. Students' involvement in the collaborative learning environment which emphasises interaction with peers (sharing class work, encouragement, and help the others) was also monitored through the students' written records.

4. 5. 3. Translation of the Instruments

To assess the reliability of the translation of the questionnaire instruments in this study both Chinese and English versions of all the questionnaires were sent to one veteran English teacher and one physical education expert from Taiwan. The English teacher had taught in the field for more than thirty years, and had graduated from the University of Carolina. The physical education teacher had taught the subject of physical education for twenty years, and had graduated from the National Normal University. These two experts verified that the questionnaires and instruments in the English and Chinese versions were the same in content and meaning (see Appendix K).

4. 6. Validation of Questionnaires

4. 6.1. Validation of Student's Characteristics Questionnaires

In order to validate the scales developed for the study for use with these Taiwanese students, the following procedures were adopted. Firstly, item analysis was undertaken to eliminate any items, which did not provide discrimination. Secondly, a factor analysis was then undertaken to assess the relative contribution made by each item to the constructs underlying the scale. Thirdly, Cronbach's α was used to assess the internal consistency (reliability) of the constructs. Only those items that discriminated successfully and loaded significantly on the underlying factors were retained for the analysis. Only those constructs that demonstrated acceptable reliability were utilised.

1. Item Analysis:

The following steps were taken in this analysis:

(1.) Reverse items of the scale were scored in positive form.

(2.) Total scores for the scale were calculated for all participants.

(3.) Total scores were arranged in order from high to low.

(4.) The top 27% and the bottom 27% of the sample were divided into two groups.

(5.) The difference in means for each item between the groups was tested by means of a t-test.

(6.) The items that showed no significant difference were eliminated.

a. Attributions in Learning.

Table 16 reports the item analysis for the concept of attributions in learning. Except for item 3, item 12 and item 14, all the items were statistically significant and thus showed good discrimination. So item 3, item 12 and item 14 were deleted from the analysis.

Table16. Item analysis for attributions in learning

Item	t-value	p-value
1. I practise hard in PE class.	4.837	<0.0001
2. I will work harder than other classmates in this class.	4.208	<0.0001
3. I feel useless in the PE classes.	0.000	1.000
4. I would like to learn as much as possible.	4.225	<0.0001
5. In physical education classes I am often asked to do my best.	4.957	<0.0001
6. Physical education classes make me feel capable.	2.670	0.01
7. I can easily achieve the goals set by the teacher.	3.498	0.001
8. I expect to sweat a lot in this course.	5.099	<0.0001
9. I get worried that I will look silly in physical education class.	3.045	0.004
10. I feel that I work hard in physical education class.	4.957	<0.0001
11. I feel each of my classmates tries to get the better of others.	7.518	<0.0001
12. Physical education makes me feel bad about myself.	0.605	0.548
13. I feel PE can encourage me to challenge my ability.	3.460	0.001
14. I do not need to work hard in physical education class.	1.564	0.124

b. Goal Orientation

Table 17 reports the item analysis for the concept of goal orientation. Except item 5 and item 8, all the items were significantly different. Item 5 and item 8 were therefore deleted from the analysis.

Table 17. Item analysis for goal orientation

Item	t-value	p-value
1. I can keep practising hard.	4.105	<0.0001
2. I get the knack of doing a new skill.	8.241	<0.0001
3. I do something I could not do before.	3.095	0.003
4. I learn a new skill by trying hard.	2.826	0.007
5. I work really hard.	1.426	0.160
6. Something makes me want to practice more.	3.303	0.002
7. A skill I learn really feels right.	5.336	<0.0001
8. I do my very best.	1.506	0.138
9. I am the only one who can do a play or skill.	6.064	<0.0001
10. I can do better than my friends.	5.181	<0.0001
11. The others cannot do as well as me.	5.902	<0.0001
12. Others mess-up and I do not.	3.407	0.001
13. I beat the others.	5.574	<0.0001
14. I have the highest score.	4.233	<0.0001
15. I am the best.	5.000	<0.0001
16. I am more skilled than other people.	5.436	<0.0001

c. Self-efficacy

Table 18 reports the item analysis for the construct of self-efficacy. Except for item 4, item 8, item 9, item 13 and item 15, all the items were significantly different. So item 4, item 8, item 9, item 13 and item 15 were deleted as they did not provide adequate discrimination within this construct.

Table 18. Item analysis for self-efficacy.

Item	t-value	p-value
1. I cannot concentrate on the work when I have to.	2.237	0.030
2. When I encounter something I cannot handle, I would keep trying until it is done.	-2.024	0.048
3. I seldom achieve the important objectives I set for myself.	5.631	<0.0001
4. After making a plan, I can carry it out.	-1.318	0.193
5. I usually give up before things are done.	6.378	<0.0001
6. I would avoid facing difficulties.	8.485	<0.0001
7. If things look complicated, I will not give it a try at all.	5.928	<0.0001
8. Even if I do not like something, I would persist to finish it.	-0.789	0.434
9. When I have decided to do something, I will do it right away.	0.991	0.326
10. When I learn something new, if it does not go smoothly at the beginning, I will give it up very soon.	6.884	<0.0001
11. I cannot deal properly with unexpected problems.	4.616	<0.0001
12. When new things look difficult, I would avoid learning them.	5.736	<0.0001
13. I am not confident in my capability.	-1.445	0.154
14. Failure can make me work harder.	2.987	0.004
15. I am independent.	-1.052	0.298
16. When encountering difficulties, I would give up easily.	5.908	<0.0001
17. I seem to be incapable of handling most problems in my life.	5.336	<0.0001

2. The Factor Analysis

Following the deletion of items that failed to discriminate, factor analysis was conducted to confirm the key sub-concepts of each scale. A factor was selected by using the criteria of an eigenvalue greater than 1 (when including items with a loading of at least 0.5). Once a factor had been identified the items were examined to identify the appropriate label for that construct.

a. Attributions in Learning.

Table19. Factor analysis for attributions in learning

Factor	Item	Loading	Eigenvalue	Explained Variance	Cumulative explained variance
Factor1	Item7	0.807	2.502	22.742%	22.742%
Effort	Item13	0.770			
	Item6	0.719			
	Item9	-0.557			
Factor2	Item2	0.786	2.209	20.082%	42.824%
Ability	Item4	0.746			
	Item8	0.723			
	Item11	0.515			
Factor3	Item10	0.842	1.782	16.204%	59.027%
Task	Item1	0.561			
difficulty	Item5	0.417			

Table 19 shows the factor analysis for the construct of attributions in lning. The three grouped factors could explain 59.027% of the total variance in the construct.

It was noted that item 7- “I can easily achieve the goals set by the teacher” and item13- “I feel PE can encourage me to challenge my ability”, were classified in this analysis under the factor of effort after having been identified in the North American based literature as task difficulty related. This provides evidence of the need to validate instruments, within the cultural framework in which they are being used.

b. Goal Orientation

Table20 shows the results of the factor analysis for the construct of goal orientation. These three factors could explain 61.878% of the total variance in this construct. A fourth factor identified items 4 and item 6. However, Wu (1999) indicated that we should eliminate sub factors of only two items for enhancing validity and so these items were removed from the analysis. It should be noted also that there are only two factors (ego and task orientation) in the original scale. In this factor analysis three factors emerged. Both factor one and factor two represented an ego orientation. Following further examination of the items, these have been interpreted as maximising the probability of attributing high performance to oneself (factor 1) and minimising the probability of attributing low ability to oneself (factor 2). In an earlier observation of this distinction, Dweck (1986) referred to the focus on a performance goal and Ames (1984a) used the term ability-focus goal. For this study, these two terms were adopted to distinguish between these two factors.

Table20. Factor analysis for goal orientation

Factor	Item	Loading	Eigenvalue	Explained Variance	Cumulative explained variance
Factor1	Item10	0.732	2.586	21.547%	21.547%
Ego	Item13	0.684			
ability -	Item9	0.643			
focus	Item16	0.602			
Factor2	Item14	0.832	2.573	21.439%	42.986%
Ego	Item12	0.820			
performance	Item15	0.666			
-focus	Item11	0.584			
Factor3	Item2	0.824	2.267	18.892%	61.878%
Task	Item3	0.816			
	Item1	0.643			
	Item7	0.512			

c. Self-efficacy

Table 21 shows the results of the factor analysis of the construct of self-efficacy. The three factors could explain 57.099% of the total variance. Once again, in this factor analysis a number of items were noted to have positioned themselves differently from expectation. Two items, item 5 and item 7, migrated into the concept of managing environmental change from their initial placement with the concepts of goal achieving and problem solving respectively. Item 2 and item 16 were also reclassified under the concept of problem solving from their original siting within the concepts of goal achievement and managing environmental change.

Table 21. Factor analysis for self-efficacy

Factor	Item	Loading	Eigenvalue	Explained variance	Cumulative explained variance
Factor1	Item12	0.740	3.022	25.187%	25.187%
Managing	Item6	0.729			
environmental	Item10	0.720			
change	Item5	0.671			
	Item7	0.617			
Factor2	Item17	0.785	2.261	18.844%	44.031%
Problem	Item16	0.707			
solving	Item11	0.678			
	Item2	-0.521			
Factor3	Item1	0.700	1.568	13.068	57.099%
Goal	Item3	0.658			
achievement	Item14	0.507			

3. Internal Consistency

Finally, in order to test the internal consistency of the three constructs and their sub-concepts used to describe students' characteristics, Cronbach's α was used. A value of Cronbach's α of more than 0.7 was set as an indication of acceptable reliability.

a. Attributions in Learning

Table 22 shows the Cronbach's α for the construct -attributions in learning. Item 9 which was originally included within the sub-concept of effort (factor1) was excluded because the Cronbach's α was improved when we deleted this item. The overall Cronbach's α was 0.7418 in this construct. The Cronbach's α of 0.5917 for factor 3, task difficulty, was of some concern. It was therefore omitted from the analysis.

Table 22. Internal consistency analysis of the construct of attributions in learning

Factor	Item	Corrected item to total correlation	Cronbach's α (factors)	Cronbach's α for construct
Factor1	Item7	0.5631	0.7499	0.7418
Effort	Item13	0.6203		
	Item6	0.5848		
Factor2	Item2	0.4938	0.6909	
Ability	Item4	0.4773		
	Item8	0.5211		
	Item11	0.4078		
Factor3	Item10	0.4757	0.5917	
Task	Item1	0.4521		
difficulty	Item5	0.2883		

b. Goal Orientation

Table 23 shows the results of Cronbach's α for the construct of goal orientation. The overall Cronbach's α of 0.8244 indicates good reliability for the overall construct as well as acceptable reliability for each of the contributing factors.

Table 23. Internal consistency analysis of the construct of goal orientation

Factor	Item	Corrected item to total correlation	Cronbach's α (factors)	Cronbach's α for construct
Factor1 *Ego (ability -focus goal)*	Item10	0.6159	0.7390	0.8244
	Item13	0.5104		
	Item9	0.4609		
	Item16	0.5763		
Factor2 *Ego (performance -focus goal)*	Item14	0.6256	0.7969	
	Item12	0.5628		
	Item15	0.6624		
	Item11	0.5953		
Factor3 *Task*	Item2	0.7096	0.7111	
	Item3	0.4668		
	Item1	0.4395		
	Item7	0.3935		

c. Self-efficacy

Table 24 shows the results of the internal consistency analysis for the construct of self-efficacy. Item 2 was excluded from factor 2 because the Cronbach's α improved with its deletion. In addition, the Cronbach's α of factor 3 did not meet the criterion and it was therefore excluded from the analysis. It was noted that the overall Cronbach's α 0.8204 suggests a reasonable level of robustness.

Table24. Internal consistency analysis of the construct of self-efficacy

Factor	Item	Corrected item to total correlation	Cronbach's α (factors)	Cronbach's α for construct
Factor1	Item12	0.6099	0.8188	0.8204
Managing	Item6	0.5855		
environmental	Item10	0.6965		
change	Item5	0.5798		
	Item7	0.5925		
Factor2	Item17	0.6169	0.7137	
Problem	Item16	0.5894		
solving	Item11	0.4046		
Factor3	Item1	0.1702	0.4056	
Goal	Item3	0.3375		
achievement	Item14	0.2359		

4. The Revised Questionnaire

Table 25 shows the revised questionnaire, which was used in the analysis. It included a total of 35 items reduced from the original 47 items, and comprised three scales (attributions in learning, goal orientation, and self-efficacy). The dimension of each factor used in the analysis is identified together with the contributing individual items.

Table25. Constructs, subconcepts (factors) and items used in the analysis of student characteristics.

Dimension	Items
Construct one (Attributions in learning, 8 items)	
Effort	7. I can easily achieve the goals set by the teacher.
	13. I feel PE can encourage me to challenge my ability.
	6. Physical education makes me feel capable..
	9. I get worried that I will look silly in physical education class.
Ability	2. I will work harder than other classmates in this class.
	4. I would like to learn as much as possible.
	8. I expect to sweat a lot in this course.
	11.I feel each of my classmates tries to get the better of others
Construct two (Goal orientation, 12 items)	
Ego	10. I can do better than my friends.
(Ability-focus)	13. I beat the others.
	9. I am the only one who can do a play or skill.
	16. I am more skilled than other people.
Ego	14. I have the highest score.
(Performance-focus)	12. Others mess-up and I do not.
	15. I am the best.
	11. The other cannot do as well as me.
Task	2. I get the knack of doing a new skill.
	3. I do something I could not do before.
	1. I can keep practising hard.
	7. A skill I learn really feels right.
Construct three (self-efficacy in learning, 9 items)	
Managing	12.When new things look difficult, I would avoid learning them.
Environmental change.	6. I would avoid facing difficulties.
	10. When I learn something new, if it does not go smoothly at the beginning, I will give it up very soon.
	5. I usually give up before things are done.
	7. If things look complicated, I will not give it a try at all.
Problem solving.	17. I seem to be incapable of handing most problems in my life.
	16. When encountering difficulties, I will give up easily.
	11. I cannot deal properly with unexpected problems.
	2. When I encounter something I cannot handle, I will keep trying until it is done.

4. 6. 2. Validation of Students' Learning Experience Questionnaire

A questionnaire (student learning experiences) was developed by the researcher to assess the ways learners experienced the processes of goal setting, self-monitoring, self-evaluation, self-reinforcement and resources management in the two groups. The learning experiences

questionnaire was developed using the literature on self-regulated learning. Table 26 shows the 15 items of the learning experience questionnaire (Appendix C).

Table 26. Learning experiences questionnaire used in this study (Five subscales 15 items).

Dimension	Items
Goal setting	1. During the tennis class, I set goals for my self that I intend to achieve.
	2. During the tennis class I need to find out what the teacher wants me to achieve.
	3. The teacher always tells me clearly what I need to do to get a good mark in the unit.
Self-monitoring	4. The teacher's feedback is essential to my learning.
	5. I don't have the knowledge to understand whether I am doing things properly.
	6. The teacher gives me control over how I work during the physical education class.
Self-evaluation	7. In this class I am able to work out what is a good performance for me.
	8. I always compare my performance against the other students in my class.
	9. I have learnt how to know by myself when I am doing well.
Self-reinforcement	10. I depend on the teacher to encourage me for my efforts.
	11. It is important that the other students recognize my ability.
	12. I am working hard in this unit to get a good grade.
Seeking help	13. I work with other students in order to understand the class material better.
	14. I ask the teacher for help when I am struggling with a difficult skill.
	15. Even if I am having trouble learning a skill, I will not ask anyone for help.

Table 27. The item analysis of the students' learning experience questionnaire

Item	t-value	p-value
1.During the tennis class, I set goals for myself that I intend to achieve.	10.426	<0.0001
2.During the tennis class I need to find out what the teacher wants me to achieve.	9.621	<0.0001
3.The teacher always tells me clearly what I need to do to get a good mark in this unit.	10.753	<0.0001
4.The teacher's feedback is essential to my learning.	11.622	<0.0001
5.I don't have the knowledge to understand whether I am doing things properly.	5.751	<0.0001
6.The teacher gives me control over how I work during the physical education class.	8.858	0.01
7.In this class I am able to work out what is a good performance for me.	12.097	0.001
8.I always compare my performance against the other students in my class.	6.726	<0.0001
9.I have learned how to know by myself when I am doing well..	8.226	0.004
10.I depend on the teacher to encourage me in my efforts.	6.800	<0.0001
11.It is important that the other students recognize my ability.	7.582	<0.0001
12.I am working hard in this unit to get a good grade.	12.817	<0.0001
13.I work with other students in order to understand the class material better.	9.502	<0.0001
14.I ask the teacher for help when I am struggling with a difficult skill.	6.472	<0.0001
15.Even if I am having trouble learning a skill, I will not ask anyone for help.	11.339	<0.0001

Item analysis was also used to test the discrimination of all the items used in the students' learning experience questionnaire. The operational steps were the same as those described previously for the student characteristics data. As table 22 shows, all the items of the students' learning experience questionnaire were statistically significant, thus confirming that the learning experience for the experimental and the control groups were perceived by the participant as being qualitatively different.

Following the item analysis, a factor analysis was conducted to confirm the five factors. Table 28 shows that the five factors could explain 64.803% of the total variance of the construct. In the analysis items 4 and 2 failed to load significantly on any factor. They were therefore eliminated from further analysis.

Table 28. Factor analysis of the questionnaire of the students' learning experience

Factor	Item	Loading	Eigenvalue	Explained variance	Cumulative explained variance
Factor1	Item8	0.796	2.140	16.464%	16.464%
Goal setting	Item9	0.769			
	Item1	0.493			
Factor2	Item5	0.830	1.868	14.371%	30.836%
Self-monitoring	Item7	0.639			
	Item10	0.600			
Factor3	Item12	0.665	1.555	11.965%	42.801%
Self-evaluation	Item3	0.645			
	Item6	0.640			
Factor4	Item15	0.849	1.461	11.240%	54.040%
Self-reinforcement	Item11	0.625			
Factor5	Item14	0.788	1.399	10.763%	64.803%
Seeking help	Item13	0.615			

With the exception of these two items the analysis confirmed the five factors of self-regulated instruction, which underpinned the difference in the learning experiences which existed, between the experimental group and the control group.

Table 29 shows the results of the internal consistency test for these five factors. The overall value of Cronbach's α (0.6933) although borderline was accepted as demonstrating adequate reliability for this scale.

Table 29. Iternal consistency of students' learning experience questionnaire

Factor	Item	Corrected item to total correlation	Cronbach's α	Cronbach's α of all factors
Factor1	Item8	0.5667	0.7518	0.6933
	Item9	0.6430		
	Item1	0.5369		
Factor2	Item5	0.4913	0.6583	
	Item7	0.4526		
	Item10	0.4666		
Factor3	Item12	0.7137	0.8419	
	Item3	0.6938		
	Item6	0.7181		
factor4	Item15	0.5152	0.6736	
	Item11	0.5152		
factor5	Item14	0.5087	0.6744	
	Item13	0.5087		

4. 6. 3. Learning Outcomes.

A questionnaire to measure student satisfaction and the tennis skill test were used to identify the learning outcomes of the two modules

1. Student Satisfaction

Satisfaction incorporates two constructs: value and enjoyment. The tennis skill test included forehand and ball serve test. The satisfaction questionnaire contained 12 items (Appendix E), which are shown in table 30. It was adapted from the Satisfaction Questionnaire developed by Xiang et al. (1997).

Table 30. The two subscales of the satisfaction questionnaire (12 items)

Dimension	Items
Value	5. The contents of the physical education lessons will be helpful and useful to me in my future life of fitness and wellness.
	7. In physical education class, I have learned how to encourage myself and work towards my goal.
	8. The physical education class can enhance the joyfulness in my daily life.
	9. Physical education can breed a bright and buoyant personality.
	10. Physical education can contribute to understanding the importance of teamwork.
	11. I feel there should be more physical education hours in the curriculum.
	12. The contents of the physical education material and lesson are relevant to my interests.
Enjoyment	1. I enjoy participating in physical education class.
	2. In physical education class, I feel it is fun to work out with a group of people.
	3. After physical education class, I feel cheerful.
	4. It feels good to successfully complete the physical education lessons.
	6. I have lots of fun during tennis class.

2. Tennis Test.

Skill in tennis was assessed, according to the protocols used in the teaching of the module (see Appendix I). Each student was assessed on the forehand drive and serve in the last two weeks (16^{th} week to 17^{th} week). These tests were identified as appropriate for assessing the skill level of beginning tennis players. For the forehand drive test, the student stands at the base line and hits five balls to the diagonal target (divided into five scores) and then calculates the total points. For the serve test, the student stands at the base line, serves ten balls into the diagonal effective area (divided into 6 and10 points), five balls to the right

and five balls to the left. The total points are then calculated out of a maximum of 100 (Verducci ,1980).

4. 6.3. Validation of Students' Satisfaction Questionnaire

In the case of the students' satisfaction questionnaire, the processes of item analysis, factor analysis, and internal consistency analysis were also used to ensure the validity and reliability of this questionnaire. Table 31 shows that every item of the students' satisfaction questionnaire showed good discrimination.

Table 31. Item analysis of the students' satisfaction questionnaire

Item	t-value	p-value
1. I enjoy participating in physical education class.	8.224	<0.0001
2. In physical education class, I feel it is fun to work out with a group of people.	4.906	<0.0001
3. After physical education class, I feel cheerful.	6.683	<0.0001
4. It feels good to successfully complete the physical education lessons	7.115	<0.0001
5. The content of the physical education lessons will be helpful and useful to me in my future life of fitness and wellness.	6.308	<0.0001
6. I have lots of fun during tennis class.	11.770	<0.0001
7. In physical education class, I have learned how to encourage myself and work toward my goal.	10.303	<0.0001
8. Physical education class can enhance the joyfulness in my daily life.	12.893	<0.0001
9. Physical education can breed a bright and buoyant personality.	8.650	<0.0001
10. Physical education class can contribute to understanding the importance of teamwork.	6.214	<0.0001
11.I feel there should be more physical education hours in the curriculum.	6.312	<0.0001
12.The content of the physical education material and lesson are relevant to my interests.	9.604	<0.0001

Table 32 reports on the factor analysis, which shows that two factors could explain 62.250% of the total variance in the students' satisfaction. Four items-4, 7, 8 and 9 did not load significantly on either of these two factors and so were discarded from further analysis. Factor 1 can be identified as containing items related to the value of the learning experience whereas factor 2 was comprised of items relating to the enjoyment of the learning experience.

Table 32. Factor analysis of students' satisfaction questionnaire

Factor	Item	Loading	Eigenvalue	Explained variance	Cumulative explained variance
Factor1	Item11	0.825	2.804	35.051%	35.051%
Value	Item12	0.713			
	Item 6	0.708			
	Item 5	0.702			
	Item10	0.645			
Factor2	Item 2	0.781	2.256	28.199%	63.250%
Enjoyment	Item 3	0.778			
	Item 1	0.734			

Table 33 shows the results of the test of the internal consistency of the factors in students' satisfaction. The Cronbach's α for the total scale was 0.8429, which was accepted as showing good reliability.

Table 33. Internal consistency of the scale measuring students' satisfaction

Factor	Item	Corrected item to total correlation	Cronbach's α	Cronbach's α of all factors
Factor1	Item11	0.6146	0.8220	0.8429
Value	Item12	0.6654		
	Item 6	0.7511		
	Item 5	0.5891		
	Item10	0.4878		
Factor 2	Item 2	0.4369	0.7141	
Enjoyment	Item 3	0.6208		
	Item 1	0.5533		

4. 7. Data Analysis

The statistical Package for the Social Sciences (SPSS/PC11.0) was used for statistical analysis and the 0.05 levels ($p < .05$) were used to determine whether any differences were significant.

Learning experiences:

Confirmation of pre-requisite conditions: Firstly, ANOVA was used to confirm that the

learning experiences of the two groups were different with regard to the dimensions of goal setting, self-monitoring, self-evaluation, self-reinforcement and seeking help.

Learning outcomes:

Secondly, ANCOVA was used to examine whether the learning outcomes satisfaction (valuing and enjoyment) and tennis skill were significantly different between the experimental and control groups, when taking into account the effects of students' characteristics.

Student characteristics:

Consistent with the theoretical framework for the study, covariate analysis was used to explore the effects of self-regulated learning instruction on learning outcomes after adjustment for the impact of selected students' characteristics. Specifically the analysis will provide information on the effects of attribution style, self-efficacy and goal orientation on learning outcomes for this group of students.

CHAPTER FIVE

Results

This results chapter is divided into four sections. The first section compares the student characteristics of the experimental and control groups. The second section examines the differences in the students' learning experiences in the experimental and control groups. The third section tests the hypotheses concerning predicted differences in learning outcomes between the experimental and control groups

5. 1. Descriptive Statistics of Students' Characteristics

The student characteristics questionnaire included three constructs (attributions in learning, goal orientation and self-efficacy), which were included in the questionnaire administered to the two groups before the intervention.

In order to test the whether the experimental and control groups could be said to come from the same populations, the homogeneity test and Levene test were used. The Box's M value for this student characteristics data set was 4.01 with the p-value=0.69. This indicates that the pattern of distribution of the data was similar between experimental group and control group. Table 34 shows the result of the Levene test, which was used to examine the homogeneity of the sub-constructs of the students' characteristics (attributions in learning, goal orientation, and self-efficacy). The result shows that student's goal orientation 3 (task) demonstrated a lack of homogeneity. The control group on average had a higher degree of variability than the experimental group. No explanation could be given for this phenomenon.

Table 34. The results of homogeneity testing of each factor of the students' characteristics between experimental and control groups

	Levene value	Degree of freedom	p-value
Attribution1	0.307	1	0.581
Attribution2	1.512	1	0.222
Goal orientation1	0.013	1	0.910
Goal orientation2	0.172	1	0.679
Goal orientation 3	8.618	1	0.004
Self-efficacy 1	1.613	1	0.207
Self-efficacy 2	0.596	1	0.442

Table 35 shows the comparisons of the means scores and standard deviations for the students' characteristics between the experimental and control groups. The results show p-values of 0.55, 0.85 0.61 and 0.63 for the differences between the group means on their dimensions of the constructs of attribution in learning and the goal orientation. This has been taken to mean that there was no difference between experimental and control groups with regard to these characteristics. However, there were significant differences between the experimental and control groups on the construct of self-efficacy. It shows that the experimental group was more independent and confident than the control group on both the dimension of managing environmental change and problem solving.

Table 35. Comparisons of students' characteristics between the experimental and control groups

	Experimental group (n=51) Mean±SD	Control group (n=49) Mean±SD	p-value for t- test
Attribution1 (Effort)	2.57±0.42	2.62±0.40	0.55
Attribution 2 (Ability)	2.31±0.41	2.33±0.51	0.85
Goal orientation1 (Ego- ability -focus)	1.96±0.41	2.00±0.51	0.63
Goal orientation2 (Ego- performance -focus)	1.86±0.37	2.02±0.50	0.61
Goal orientation3 (task)	2.53±0.50	2.69±0.32	0.004
Self-efficacy1 (managing environment change)	2.65±0.43	1.93±0.37	<0.0001
Self-efficacy2 (Problem solving)	2.55±0.35	2.18±0.28	<0.0001

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5. 2. Confirming the Differences in the Learning Experiences of the Experimental and Control Groups

Table 36 shows the results for the students' perception of their learning experiences in the areas of goal setting, self-monitoring, self-evaluation, self-reinforcement, and seeking help. The experimental group scored significantly higher than the control group in all areas. This confirms that the experimental group experienced more self-regulated learning strategies in their learning and that the intervention therefore did deliver learning experiences that were qualitatively different from those of the control group.

Table 36. Comparisons of students' experience of self-regulated learning strategies between experimental and control group

	Experiment group (n=50) Mean±SD	Control group (n=50) Mean±SD	P-value for t- test	Effect size
Experience 1 (Goal-setting)				
1. During tennis class, I set goals for my self that I intend to achieve.	3.10±0.46	1.88±0.48	<0.0001	
8. I always compare my performance against the other students in my class.	2.53±0.81	1.67±0.66	<0.0001	
9. I have learnt how to know by myself when I am doing well.	3.12±0.77	2.10±0.65	<0.0001	
Total	2.92±0.52	1.88±0.35	<0.0001	2.390
Experience 2 (Self-monitoring)				
5. I don't have the knowledge to understand whether I am doing things properly.	2.55±0.99	1.84±0.72	<0.0001	
7. In this class I am able to work out what is a good performance for me.	2.90±0.67	1.84±0.75	<0.0001	
10. I depend on the teacher to encourage me for my efforts.	2.80±0.75	2.00±0.71	<0.0001	
Total	2.75±0.61	1.89±0.43	<0.0001	0.826
Experience3 (Self-evaluation)				
3. The teacher always tells me clearly what I need to do to get a good mark in this unit.	3.27±0.57	2.06±0.56	<0.0001	
6. The teacher gives me control over how I work during physical education class.	3.24±0.59	1.98±0.59	<0.0001	
12. I am working hard in this unit to get a good grade.	3.61±0.49	2.18±0.70	<0.0001	
Total	3.37±0.38	2.07±0.42	<0.0001	1.625
Experience4 (Self-reinforcement)				
11. It is important that the other students recognize my ability.	3.10±0.81	2.06±0.66	<0.0001	
15. Even if I am having trouble learning a skill, I will not ask anyone for help.	3.31±0.86	1.78±0.59	<0.0001	
Total	3.21±0.69	1.92±0.40	<0.0001	1.183
Experience5 (Seeking help)				

13. I work with other students in order to understand the class material better.	3.08±0.59	1.86±0.61	<0.0001	
14. I ask the teacher for help when I am struggling with a difficult skill.	2.86±0.78	1.88±0.60	<0.0001	
Total	2.97±0.56	1.87±0.42	<0.0001	1.122

5. 3. Testing Hypothesis (H 1) - Taking the Satisfaction as the Dependent Variable after taking into account the Entry Characteristics of the Students Involved.

The ANCOVA was conducted with two steps include: testing the homogeneity of regression, if the covariate variable is not significant (p>0.05), which means it obeys the homogeneity of regression, and then we continue to conduct the multivariate analysis.

Table 37. The effect of group membership on the learning outcome of global satisfaction after adjustment for student characteristics-ANCOVA analysis.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	31.581	8	3.948	2.108	.043	.156
Intercept	66.044	1	66.044	35.274	.000	.279
CAUFA1	2.840	1	2.840	1.517	.221	.016
CAUFA2	6.137	1	6.137	3.278	.074	.035
GOAFA1	3.875	1	3.875	2.070	.154	.022
GOAFA2	4.655	1	4.655	2.486	.118	.027
GOAFA3	.104	1	.104	.055	.814	.001
SELFA1	12.038	1	12.038	6.429	.013	.066
SELFA2	3.082	1	3.082	1.646	.203	.018
GROUP	6.850	1	6.850	3.659	.059	.039
Error	170.380	91	1.872			
Total	4264.749	100				
Corrected Total	201.961	99				

The test of interaction effect between treatment groups and the factors of student characteristics for satisfaction indicated there was no interaction effect between the factors of student characteristics and study groups to satisfaction (p=0.142). Therefore, we continued to conduct the multivariate analysis.

After adjustment for the factors of student characteristics, table 37 shows that there was no

significant difference between the two groups with regards to global satisfaction (p = .059). No effect was found for the dimension of satisfaction. Therefore, **hypothesis 1** (the self-regulated learning group will show higher levels of satisfaction in tennis than the curriculum instructional group after taking into account the entry characteristics of the students involved) **was rejected**.

3.1. Satisfaction through Valuing (H1-1)

The ANCOVA was conducted with two steps include: testing the homogeneity of regression, if the covariate variable is not significant (p>0.05), which means it obeys the homogeneity of regression, and then we continue to conduct the multivariate analysis.

Table 38. The effect of group membership on the learning outcome of satisfaction through valuing after adjustment for student characteristics-ANCOVA analysis.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	55.277	8	6.910	2.876	.007	.202
Intercept	79.000	1	79.000	32.881	.000	.265
CAUFA1	2.998	1	2.998	1.248	.267	.014
CAUFA2	10.754	1	10.754	4.476	.037	.047
GOAFA1	3.433	1	3.433	1.429	.235	.015
GOAFA2	1.126	1	1.126	.469	.495	.005
GOAFA3	.113	1	.113	.047	.829	.001
SELFA1	17.518	1	17.518	7.291	.008	.074
SELFA2	5.485	1	5.485	2.283	.134	.024
GROUP	1.710	1	1.710	.712	.401	.008
Error	218.634	91	2.403			
Total	4215.240	100				
Corrected Total	273.912	99				

The test of interaction effect between treatment groups and the factors of student characteristics for value of satisfaction showed there was no interaction effect between the factors of student characteristics and study groups to value of satisfaction (p=0.158). Therefore, we continue to conduct the multivariate analysis.

After adjustment for the factors of student characteristics, the table 38 shows that there was no difference between the two groups with regards to satisfaction through valuing

(p=0.401). No effect was found for the satisfaction dimension of valuing. Therefore, **hypothesis 1-1** (the self-regulated learning group will show higher levels of satisfaction through valuing in tennis than the curriculum instructional group after taking into account the entry characteristics of the students involved) **was rejected.**

3.2. Satisfaction through Enjoyment (H1-2)

Table 39. The effect of group membership on the learning outcome of satisfaction through enjoyment after adjustment for student characteristics-ANCOVA analysis.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	29.152	8	3.644	1.521	.161	.118
Intercept	54.247	1	54.247	22.646	.000	.199
CAUFA1	2.686	1	2.686	1.121	.292	.012
CAUFA2	2.807	1	2.807	1.172	.282	.013
GOAFA1	4.345	1	4.345	1.814	.181	.020
GOAFA2	10.587	1	10.587	4.420	.038	.046
GOAFA3	9.554E-02	1	9.554E-02	.040	.842	.000
SELFA1	7.583	1	7.583	3.165	.079	.034
SELFA2	1.367	1	1.367	.571	.452	.006
GROUP	15.422	1	15.422	6.438	.013	.066
Error	217.980	91	2.395			
Total	4433.222	100				
Corrected Total	247.132	99				

The test of interaction effect between treatment groups and the factors of student characteristics for satisfaction through enjoyment showed there was no interaction effect between the factors of student characteristics and study groups for satisfaction through enjoyment (p=0.281). Therefore, we continued to conduct the multivariate analysis.

After adjustment for the factors of student characteristics, Table 39 shows that there was a significant difference between the two groups with regards to satisfaction through enjoyment. A medium effect was found ($\eta^2 = .066$); (p=0.013). Therefore, **hypothesis 1-2** (the self-regulated learning group will show higher levels of satisfaction through enjoyment of the tennis unit than the curriculum instructional group after taking into account the entry characteristics of the students involved) **was accepted.**

5. 4. Testing hypothesis (H 2) -Taking the Performance as the Dependent Variable after taking into account the Entry Characteristics of the Students Involved

Table 40. The effect of group membership on the learning outcome of performance (skilled learning) after adjustment for student characteristics-ANCOVA analysis

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	1330.659	8	166.332	8.955	.000	.440
Intercept	3541.429	1	3541.429	190.658	.000	.677
CAUFA1	10.683	1	10.683	.575	.450	.006
CAUFA2	9.828	1	9.828	.005	.942	.000
GOAFA1	1.227	1	1.227	.066	.798	.001
GOAFA2	72.213	1	72.213	3.888	.052	.041
GOAFA3	.724	1	.724	.039	.844	.000
SELFA1	4.135	1	4.135	.223	.638	.002
SELFA2	2.296	1	2.296	.124	.726	.001
GROUP	723.576	1	723.576	38.955	.000	.300
Error	1690.301	91	18.575			
Total	619560.000	100				
Corrected Total	3020.960	99				

The test of interaction effect between treatment groups and the factors of student characteristics for performance showed there was no interaction effect between the factors of student characteristics and study groups for performance (p=0.112). Therefore, we continued to conduct the multivariate analysis.

Table 40 shows that there was a difference between the two groups with regard to performance on a tennis skill test (p=0.000). A large effect was found for the difference between the two groups with regards to performance (η^2 = .300). Students in the experimental group had higher scores (*M* =81.84, *SD* = 2.71) than those in the control group (*M* = 75.06, *SD* = 5.59). Therefore, **hypothesis 2** (there will be no difference in tennis performance between the self-regulated learning group and the curriculum instructional group after taking into account the entry characteristics of the students involved) **was rejected.**

CHAPTER SIX

Discussion

This study found that using self-regulated learning strategies not only enhanced the students' use of such strategies, which is in itself a valuable objective, but also at the same time increased performance and enjoyment in their physical education classes. However, use of the strategies failed to achieve a predicted increase in students' overall satisfaction and their valuing of the unit, which was the major goal of the intervention. Some reasons for these outcomes will be discussed. A conceptual framework, which recognized the significance of student entry characteristics of this nature, was adopted. An evaluation of this framework is included in this chapter and implications for its future development are discussed.

6. 1. Identifying the Differences between the Experimental and Control Groups in terms of the Students' Learning Experiences.

Results of the learning experience questionnaire confirmed that there was a difference in the learning experiences of the two groups, with the experimental group reporting greater application of self-regulated learning strategies than the control group. In developing understanding of how the intervention was experienced, evidence was sought from the researcher's observations and the written monitoring sheet of the students in the experimental group.

6.1. 1. The analysis of Monitoring Sheets

The experimental group students recorded monitoring sheets for improving the strategies' use by providing a basis for self-evaluation and self-reflection after the finish of each tennis class. Students needed to record each learning strategy - goal setting, self-monitoring, self-evaluation, self-reinforcement, and seeking help. The tennis class of the experimental group was divided into four groups. Before finishing the tennis class every week, each group filled out the monitoring sheet as an aid to reflect on and to develop understanding of their learning status. This section summarises the main points to emerge from the recording content (see table 41 to 45) during the ten weeks.

A. Self-evaluation

Students used the self-evaluation strategy to compare their current performance with the goal, and to record their progress and what stages of motor learning they were in. In the beginning, most students reported that the ball could not get in to the court or reach the assigned goal. In the middle stage, the researcher held a small test for the students to give them feedback and to check their learning status. Most of the students reported then that they had made progress. In the final stage, most students reported that they were getting the idea of the movement and had gained confidence in hitting the ball.

Table 41. Sample recording content of self-monitoring sheets-self-evaluation

Self-regulated strategy	Recording content
1. Self-evaluation	. It is difficult to get in the court. . I could not pass the net when I hit the ball. . I tried to understand the movement knack more. . I attempted to follow the movement knack as teacher taught. . I could not hit the ball as I thought. . I was scared of missing my forehand ball. . I looked at technique when I hit the ball. . I checked my physical state. . I evaluated the level of confidence. . I could not do well, because I am not familiar with the movement knack. . I dissatisfied the accuracy of my backhand. . I have achieved progress but I could control the ball. . I was getting in the idea of movement.

	. I've got confidence to hit the ball.

B. Goal Setting

The students identified their goals and then whether or not they could achieve the standard goals or challenge for higher goals. At the beginning, most of the students reported that they could not achieve the standard goals, but during the learning process they realized that they could make it. In the middle stage, a number of students achieved the standard goals and tried to put effort in to going beyond the standard goals. However, it was observed that some students claimed that they could reach the goals when they wanted to even though the accuracy was not satisfactory. Some students reported that they couldn't do it well, because they were not familiar with ‘the knack’. The researcher gave feedback on an individual basis to those who perceived they were unable to perform with the other students and encouraged them to seek help. In the final stage, students were becoming familiar with the strategies used and 'the knack', so they almost all could achieve the standard goals. The researcher provided a ball accuracy game, which brought out more enjoyment and interest in learning. It appeared that the students' use of goal setting strategy not only increased their goal commitment and enjoyment, but also provided a self-reflective mechanism to enhance self-actualization and involvement.

Table 42. Sample recording content of self-monitoring sheets-goal setting

Self-regulated strategy	Recording content
2. Goal-setting	. I set my self-paced goal.
	. I could not achieve the standard goal.
	. I could achieve the goal that I set before.
	. I tried to challenge the standard goal.
	. I tried to achieve my self-referenced goal.

	. I could achieve the standard goal but not often.

C. Self-monitoring

Students exchanged and discussed what they had learned in the tennis class. They set self-paced goals and tried to achieve the standard goal for gathering evidence of progress. Before they finished the tennis class, they needed to record their objective (based on the movement knack) whether or not it was achieved and check the effects of the learning. Students reported that there seemed to be a problem between cognition and practice. They had at the beginning hoped the teacher could give them feedback in the tennis class such as to remind them of the movement knack, give demonstrations, give them cues, and practice different sport parameters (changing height, direction, angle, distance, speed and so on) and so on. In the middle stage, while implementing self-referenced goals, students could make gradual progress and they reported on the ways that they were using information from their practice of the skill. In the final stage, students reported that they were getting familiar with the movement knack and were successfully monitoring their performance of the task.

Table 43. Sample recording content of self-monitoring sheets-self-monitoring

Self-regulated strategy	Recording content
3. Self-monitoring	. I discussed and exchanged the cognition of movement knack. . I needed to refine my skill because I felt there was something wrong. . I paid attention to firm my wrist and follow through.

	. I become aware of my contact point when I hit and serve the ball. . I followed the movement knack. . I monitored my self-paced goal. . I tried to achieve the standard goal. . I was conscious of the suitable parameters (height, direction, angle, distance, speed and so on) or not.

D. Self-reinforcement

In the beginning, most students reported that they did not satisfy their goal for performance, and tried to cheer themselves up and rehearsed a shadow swing. In the middle stage, students reported that they used self-expectancy to encourage themselves and remind themselves to play like others – ("I self –expected myself like other students do"). In the final stage, students reported that they seeking good scores through successful performance. In addition, the researcher provided incentive rewards to the students in the ball accuracy game to encourage them to pursue higher goals. Some groups reported that they used immediate reinforcement strategy to try to get the rewards (e.g. "I must win the rewards"). Some groups reported that they used delayed reinforcement strategies to help themselves concentrate on their practice in the tennis class (e.g. I wanted to perform well then I could back home).

Table 44. Sample recording content of self-monitoring sheets-self-reinforcement

Self-regulated strategy	Recording content
4. Self-reinforcement	. I cheered myself up when I practiced. . I used music to encourage myself. . I tried to play like teacher. . I wanted to do my best then I could take a rest.

	. I self-expected myself like other students' do. . I had to practice more so I could get good scores. . I must win the rewards. . I wanted to perform well then I could return back home.

E. Seeking Help

The researcher requested the students to learn to share, encourage and help one another to develop a collaborative learning environment. They reported that they shared their rules, and discussed the movement knack, and even shared the class work all the time.

Table 45. Sample recording content of self-monitoring sheets-seeking help

Self-regulated strategy	Recording content
5. Seeking help	. I cooperated with my group mates. . I discussed with my group mates. . I shared the class work with my group mates. . I gained remind, demonstration, and cue from the teacher.

In seeking to understand and interpret the ways in which the learning experience acted to achieve the learning outcomes of the study, it is necessary to highlight the interaction

effects between intervention strategies and motivation beliefs related to performance (Hon & Harris, 1996; Nietfeld, 2003; Zimmerman et al. 1997). The researcher believes that goal setting could play a critical motivational role in the learning process. Whatever goal setting you have, as long as learners' self-monitoring is related to their perceived goal through self-evaluating and self-recording strategies, it will lead to strengthening their intrinsic motivation for achieving self-development. Therefore, a physical education instructor needs to connect with the learner through multiple motives and activities for involvement to structure a positive learning climate.

6. 2. The Impact of the Learning Experiences on Student Outcomes

The next task was to examine the differences that could be observed between the control group and the experimental group in terms of student outcomes. From the viewpoint of learning outcomes, two constructs were measured- satisfaction and performance. Expectations for these student outcomes created the research hypotheses of the study. This section discusses the reported learning outcomes in the light of the research hypotheses.

A.) H1. (H1-1 and H1-2) The Self-regulated Learning Group will Show Higher Levels of Satisfaction (value and enjoyment) in Tennis than the Curriculum Instructional Group.

Three measures of satisfaction were recorded a global measure and the results of scales that measured two constituent dimensions of satisfaction: valuing and enjoyment.

Global satisfaction

The results showed that there were no differences between the experimental group and the control group. The hypothesis was based on the belief that the experimental group ought to feel greater satisfaction with and interest in their tennis class because the intervention of the self-regulated teaching strategies would have provided a more motivational learning climate and more supportive feedback as mentioned previously. However there may be some clues to this finding in previous research. Theodorakis (1995) indicated that sports performance is negatively correlated with satisfaction. Satisfaction will affect sports performance through the goal setting process, as the individual who is dissatisfied at a past performance will set a higher goal for enhancing the next performance. It should also be

noted based on previous research findings that those individuals with higher self-efficacy will be motivated to higher performance and task orientation (Bandura, 1991; Duda, 1992; Weinberg et al.1980). Further the ANCOVA analysis indicated that self-efficacy was directly related to global satisfaction in it own right and that this was a negative relationship. Finally, the researcher frequently reminded students in the experimental group to self-monitor themselves in the tennis class. This process may have facilitated this dissatisfaction with current performances or alternatively may even have been unpopular with students simply because of the extra demands it was placing upon them.

Satisfaction through valuing

The findings showed that there were no differences between the experimental group and the control group on this dimension. A possible explanation is that students could not master the tennis skill in a short period, because the tennis course was only provided for one semester. Therefore, the experimental group students were not able to enjoy themselves to the full by going on to learn more enterprising skills. Conversely, the control group experienced less intrinsic motivation might have felt the tennis skills so difficult, that they tried to avoid the task. In addition, students did not appear to like to the self-recording, when they were involved in self-regulated learning processes. They felt a little annoyed and perceived it as an imposition, because they just liked to play tennis rather than complete this extra task. Such inherent problems may have influenced the students in their response to valuing of satisfaction. In the process experienced by the control group, these students had no desire to challenge their ability. The instructor always told the students who lacked the commitment that they should practice hard, and that if they did not reach the standard required in the tennis content test, they would be failed. This sort of instruction may lead to students feeling a sense of learned helplessness; these two would have influenced their response to the valuing of satisfaction.

Satisfaction through enjoyment

The finding that there was a significant difference between the experimental group and the control group for the enjoyment dimension of satisfaction was encouraging. This finding was consistent with previous research and the study's hypothesis. Scanlan & Simon (1992) stated that the enjoyment of movement is part of the intrinsic motivation that leads to individuals' persistence in sports participation. In this study, the self-regulated teaching style provided the experimental group with more varied and interesting learning

experiences. It also appeared to enhance the experimental group students' intrinsic motivation and enjoyment through a greater task orientation.

In the experimental group, students were more effective using self-regulated learning strategies for goal setting (Effect size = 2.390, see Table 36). The students could identify their self-referenced goals by comparing standard goals or an individual challenge goal and practice their skills appropriately. Furthermore, information based on the student monitoring sheets and the researcher's observations supported the idea that students in the experimental group found their involvement in tennis classes more intrinsically interesting. For example, the students in the experimental group appeared to be more actively trying to meet the challenge of the learning task and were observed as still practicing even after the class had finished. In contrast, most students in the control group appeared as less motivated being observed by the researcher in behavior such as chatting, hiding in the shade, taking breakfast and so on, rather than involving themselves actively in the task during the tennis classes. This is consistent with the statistical findings that the experimental group not only performed better in the skills test but also reported more satisfaction through enjoyment.

In addition, the instructor emphasized a positive learning climate in the experimental tennis class when reminding them of the movement knacks, allowing for the practice of different sport parameters and using small tests to allow for reflection on their progress and so on. This supportive learning climate might have contributed to enhancing students' intrinsic motivation therefore leading to greater enjoyment.

B.) H2. There is no Difference in Performance between the Self-regulated Learning Group and the Curriculum Instructional Group.

In terms of performance, the finding was that there was a significant difference between the experimental group and the control group. The hypothesis that there would be no difference, was based on the notion that the traditional teaching style emphasizes disciplinary mastery and focuses on motor skills, and therefore the control group might be expected to perform the skill just as well if not better than the experimental group. The experimental group using self-regulated learning style with its stress on self-directed learning and arousing students' intrinsic motivation were predicted to experience more satisfaction than the control group. However, the results were not as originally hypothesised.

Support for these findings found in previous studies comes from Zimmerman (1994) and Mau & Chen (1993) who found that students who used self-regulated strategies demonstrate higher achievement than students who did not use these strategies. In the present study activities related to using self-regulated learning strategies in tennis classes would have allowed for increased goal related practice. For example, a small test was implemented and then practice in different sport parameters (changing height, direction, angle, distance, speed and so on) was introduced. Also, the researcher focused on encouraging students to set self-paced goals and involve themselves in collaborative learning. Therefore because the experimental group students could refine their ways of learning by themselves, they thus had more intrinsic feedback of their success in learning.

Three reasons therefore can be advanced in explanation of the superior results of the ex perimental group with regard to skilled performance.

1.) The focus on both goal setting and self-evaluation in the self-regulated learning strategies served to promote students' achievement performance as goal setting plays a critical role in the learning process.
2.) In addition to the goal setting, learners' self-monitoring awareness related to their perceived goal through self-evaluating and self-recording strategies also served to strengthen their intrinsic motivation for achieving higher performance. Therefore, the experimental group's higher levels of motivation could explain the higher performance.
3.) The researcher provided additional feedback by means of small tests to support the experimental group at the end of each lesson and then changed the sport parameters to facilitate students understanding of the cognitive object. Thus more effective feedback and practice may also have been a feature of the difference between the learning experiences

6. 3. The Individual Student Characteristics Impact upon the Learning Outcomes-Evaluation of the Conceptual Framework for the Study

The third issue revolved around the efficacy of the conceptual model used in the study. The model attempted to account for ways in which significant entry learning characteristics modified the ways in which students interacted with the learning experiences. The mediating characteristics in the model were derived from the cognitive motivation literature and were the concepts of causal attribution, goal orientation and self-efficacy.

A. Comparing Group Outcomes with the Conceptual Model and without the conceptual Model.

Table 46 shows the findings that would have been reported if a simple ANOVA design had been used to test the hypotheses of the study. In other words it shows the results for the effects of group membership on student outcomes without taking account of the individual student characteristics of the group members. Failure to take account of the student characteristics would have shown the control group as having greater satisfaction through valuing (ANCOVA reported no differences) and would have shown no differences in satisfaction through enjoyment (ANCOVA identified the experimental group reporting significantly more satisfaction trough enjoyment. Notice should also be taken of the difference in the F ratio for global satisfaction (ANOVA, F=0.287: ANCOVA, F=3.658). Though not reflecting a significant difference between the groups it nonetheless further illustrates how the same set of outcomes can be interpreted completely differently when placed within an inappropriate or limiting design. In both analyses the difference in performance between the groups remains clear and unequivocal.

Table 46. Comparing group outcomes with the conceptual model and without the conceptual model.

Learning outcomes	Experimental group	Control group	ANOVA	**ANCOVA**
Global satisfaction	6.288±1.350	6.452±1.516	F=0.287 P=0.583	**F=3.658** **P=0.058**
Satisfaction Through valuing	5.937±1.555	6.333±1.714	F=4.523 P=0.036	**F=0.712** **P=0.401**
Satisfaction through enjoyment	6.660±1.636	6.272±1.510	F=1.515 P=0.221	**F=6.438** **P=0.013**
Performance	81.843±2.716	75.061±5.585	F=60.186 P=0.000	**F=38.955** **P=0.000**

B. Evaluation of the Student Characteristics of this Study.

A comparison of the four ANCOVAs which were used to test the four hypotheses of the study shows that no individual difference construct was consistently related to the outcomes independently of the intervention. However some individual constructs were shown to act significantly and independently with regard to different outcomes. For example Table 37 shows that Self-Efficacy (managing environmental change) was significantly related to the outcome of global satisfaction (p=.013). The relationship was a negative one, that is the greater the self-efficacy the lower the global satisfaction reported. Self-efficacy (managing environmental change) was also directly and significantly related to satisfaction through valuing (p=.008) as was Causal Attributions (Ability) (p=.037). Finally, Goal-orientation 2 (Ego performance focus) impacted directly and significantly on satisfaction through enjoyment (p=.038).

The relationships found in this study are interesting and worthy of exploration. It may be that those with higher self-efficacy also had higher aspirations. As a result they were more demanding of the learning experiences and the goals they were expected to produce. It was observed for example, that some students from this group had complained that they could not go on to practice after the class had finished when some school's faculty need to use the tennis court. They clearly found this frustrating and a barrier to being able to achieve their goals for learning. Hence this may help to explain lower levels of satisfaction through valuing. The implications as instructors would then be that we need to defend the opportunity for students to enhance their perceived competence developed through their learning experiences if we are to really reinforce the value of their learning outcomes.

Clearly the concept of self-efficacy demonstrates the greatest impact of the student characteristics identified in this conceptual framework. The implications however are not as simple as just noting the need to pay attention to the learner's feelings of self-efficacy. Rather there is a two-way relationship in play. Students with higher levels of self-efficacy may be more demanding of their learning experiences and consequently may demand higher levels of support both within the classroom and beyond it through the opportunity for greater access to resources to practice, develop and implement skills that are supposed to be important and of value. However constructs of both causal attribution and goal orientation have been shown to have some impact in understanding the relationship between the way students experience learning and the outcomes they achieve. Therefore it

is concluded that the conceptual framework adopted for this study is of value and worthy of continuing development.

C. The Development and Validation of the Constructs Used in the Model within the Taiwan Context

In developing and validating the questionnaires for this study, it was noted in the results chapter that a number of items were eliminated and a number of items became reclassified within other sub concepts than those they were expected to. Some of this migration may be explained by difficulties in interpretation caused by the translation process. However it is believed that at least some of the changes reflected the different cultural framework within which this study was implemented. Students from Taiwan can be expected to frame their understanding and their evaluation of situations through a different set of values, beliefs and assumptions than those held by students from countries such as the United States and Australia where these constructs were originally developed. For example the emergence of two dimensions of ego orientation in the goal orientation questionnaire and the weaker profile for the dimension of task orientation appears particularly interesting and relevant to this study. Given that a central underpinning to the model of self-regulated learning is that students need to experience a shift towards a more task based orientation and the development of an external locus of control, then the ways in which Taiwan students modify their concern with social comparison as a means of self evaluation becomes a major interest within this sort of work.

It must therefore be concluded that any continuing work within a conceptual model such as that adopted for this study needs to involve continuing refinement and validation of the use of its constructs with the population that is being studied.

Chapter Seven

Conclusion, Implications and Recommendations

The purpose of this research was to investigate the effects of an intervention using self-regulation supporting strategies on college students' learning and satisfaction in Physical Education in Taiwan. This chapter presents three sections: conclusion, implications and recommendations.

7. 1. Conclusion

This study adds to the evidence that self-regulated learning in tennis classes has immediate benefits for students. The result of the present study supports using of self-regulated learning to enhance students' learning experiences and learning outcomes. Within the limits of this investigation, the conclusions of the study were

1. The use of self-regulated learning strategies produces more effective skilled learning (performance) in physical education.
2. The use of self-regulated learning strategies increases satisfaction through enjoyment in physical education.
3. The use of self-regulated learning strategies does not enhance overall satisfaction nor does it increase satisfaction through valuing in physical education.
4. Using a person in the environment interaction model adds significantly to our understanding of student learning experiences and their outcomes.
5. The study provides some new insights into and raises some new questions about the relationship between student characteristics and physical education learning for Taiwanese students.

7. 2. Implications

Current psychology of education focuses on intrinsic motivation and the development of autonomous learning in the process of teaching students to learn how to learn. Therefore, the researcher incorporated self-regulated teaching and learning to promote students' achievement orientation and to facilitate intrinsic motivation for successful learning. This empirical study revealed that self-regulated learning instruction can contribute to enhancing students' spontaneous learning desire by increasing their enjoyment and ability to perform more effectively.

Self-regulated learning implies two critical processes: motivational beliefs and learning strategies. The processes of the self-regulated learning should focus on achievement goal setting and self-monitoring (self-evaluation and self-recording). In terms of achievement theory, goal setting plays an important role in the cognition process whereby if individuals are not able to consciously self-monitor then, their goal setting may not be helpful. Therefore competence in self-monitoring becomes essential. In this study, the researcher used the monitoring sheets for self-recording to facilitate movement performance, self-efficacy and self-reaction beliefs in the learning process and to provide feedback as a part of the learning. Finally, we also need to take into account effective class management and collaborative leaning. Teaching and learning is a complex process in which instructors should take the responsible for enabling students to learn. If student needs do not influence their knowledge, cognition, affectivity and learning experience, learning will be limited. Self-regulated learning instruction supports the need for students to be involved in their learning processes and encourages students to experience themselves as a part of the learning. It promotes students learning desire and helps them to achieve self-development through the success that results. Conversely, the traditional instruction endeavours to prescribe students learning behavior and emphasizes imitation or memorizing rather than understanding and problem solving. The teacher centred approach limits student access to autonomous learning, and only serves to reinforce many concerns expressed related to poor performance quality and lack of motivation by students.

7. 3. Recommendations

The intent of this study was to promote a focus on teaching pedagogy in physical education by examining the effect of the use of self-regulated learning strategies on college students' performance and satisfaction. This study is just a small step on the route to towards developing effective teaching strategy in tennis classes. The information is limited to female college students' implementation of self-regulated learning in Taiwan. Therefore, much further work is needed in the PE field to systematically explore these principles. Specific recommendations for future research raising from this initial study are:

1. A larger sample of college students of both genders is needed to investigate the effects of self-regulated learning in physical education classes.

2. This study has reported on the outcomes of a short-term intervention. There is a need for follow up on the longer term effects and in particular how the self-regulated learning

needs might be maintained.

3. Further work is need to identify the most relevant student entry characteristics and how these relate to performance accomplishment.

4. Future studies should use more sophisticated modeling techniques such as path analysis to better understand the interaction of the student characteristics with student learning experiences and outcomes.

5. The impact of culture upon students' interpretation of learning and achievement needs to further be explored.

6. Physical education instructors should refine their instructional methods and consider embedding self-regulated learning instruction in physical education classes or using videotape for self-reflection on the teaching processes to improve teaching quality.

7. Advanced research needed to further examine the inter-relationship between self-regulated learning methods, subject matter content and satisfaction.

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QUESTIONNAIRE A (STUDENT CHARACTERISTICS)

The following statements relate to your feelings about what you do in your Physical Education class. Please CIRCLE one of the following responses to best show how true this statement is for you? (SA) Strongly Agree, (A) Agree, (D) Disagree, (SD) Strong Disagree.

I fell really successful in physical education when…	Strongly agree	Agree	Disagree	Strongly disagree
1 I practice hard in physical education class.	1	2	3	4
2 I will work harder than other classmates in this class.	1	2	3	4
3 I feel useless in the physical education classes.	1	2	3	4
4 I would like to learning as much as possible.	1	2	3	4
5 In physical education classes I am often asked to do my best.	1	2	3	4
6. Physical education makes me feel capable.	1	2	3	4
7 I can easily achieve the goals set by the teacher.	1	2	3	4
8 I expect to sweat a lot in this course.	1	2	3	4
9 I get worried that I will look silly in physical education class.	1	2	3	4
10 I feel that I work hard in physical education class.	1	2	3	4
11 I feel each of my classmates tries to get the better to others.	1	2	3	4
12 Physical education makes me feel bad about myself.	1	2	3	4
13 I feel PE can encourage me to challenge my ability.	1	2	3	4
14 I do not need to work hard in physical education class.	1	2	3	4
15 I can keep practicing hard.	1	2	3	4
16 I get the knack of doing a new skill.	1	2	3	4

17 I do something I could not do before.	1	2	3	4
18 I learn a new skill by trying hard.	1	2	3	4
19 I work really hard.	1	2	3	4
20 Something makes me want to practice more.	1	2	3	4
21 A skill I learn really feels right.	1	2	3	4
22 I do my very best.	1	2	3	4
23 I am the only one who can do a play or skill.	1	2	3	4
24 I can do better than my friends. .	1	2	3	4
25 The other cannot do as well as me.	1	2	3	4
26 Others mess-up and I do not.	1	2	3	4
27 I beat the others	1	2	3	4
28 I have the highest score.	1	2	3	4
29 I am the best.	1	2	3	4
30 I am more skilled than other people.	1	2	3	4
31 I cannot concentrate on the work when I have to.	1	2	3	4
32 When I encounter something I cannot handle, I will keep trying until it is done.	1	2	3	4
33 I seldom achieve the important objective I set for myself.	1	2	3	4
34 After making a plan, I can carry it out.	1	2	3	4
35 I usually give up before things are done	1	2	3	4
36 I would avoid facing difficulties.	1	2	3	4
37 If things look complicated, I will not give it a try at all	1	2	3	4
38 Even if I do not like something, I would persist to finish it.	1	2	3	4
39 When I have decided to do something, I will do it right away.	1	2	3	4
40 When I learn something new, if it does not go smoothly at the	1	2	3	4

	beginning, I will give it up very soon.				
41	I cannot deal properly with the unexpected problems.	1	2	3	4
42	When new things look difficult, I would avoid learning them.	1	2	3	4
43	I am not confident in my capability.	1	2	3	4
44	Failure can make me work harder.				
45	I am independent.				
46	When encountering difficulties, I will give up easily.	1	2	3	4
47	I seem to be incapable of handling most problems in my life.	1	2	3	4

體育學習歸因量表

這部份主要在探討學生對體育學習之看法，請圈選一個最能表達你的感受的答案，並且在適當的"1234"打勾，1是非常不同意·2是不同意·3是同意、4是非常同意。感謝您的勾選。

	非常不同意	不同意	同意	非常同意
1. 體育課我努力練習。	1	2	3	4
2. 體育課我會比其他同學更努力。	1	2	3	4
3. 體育課讓我覺得自己能力不足。	1	2	3	4
4. 我想盡我所能多學一些。	1	2	3	4
5. 在體育課中，我被要求表現出我最好的能力。	1	2	3	4
6. 體育課讓我感覺自己能力不錯。	1	2	3	4
7. 在上體育課時，我都能夠輕易完成老師的要求。	1	2	3	4
8. 我想在網球課中努力學習。	1	2	3	4
9. 在上體育課時，我擔心自己看起來很笨拙。	1	2	3	4
10.我覺得上體育課時，我會很努力地練習。	1	2	3	4
11.我覺得上體育課時，同學之間試著表現比別人更好。	1	2	3	4
12.體育課使我感覺不舒服 。	1	2	3	4
13.在上體育課時，我覺得體育課會激發及挑戰我的能力。	1	2	3	4
14在上體育課時，我不需努力就可以得到成績。	1	2	3	4

學生體育學習之目標取向量表

這部份主要在探討學生對體育學習看法之目標取向，在體育學習中什麼原因是你感到體育很有成就，亦即何時你覺得體育學習感覺很有成就感，請圈選一個最能表達你的感受的答案，並且在適當的"1234"打勾，1是非常不同意·2是不同意·3是同意、4是非常同意。

感謝您的勾選。

	非常不同意	不同意	同意	非常同意
1. 我一直不斷的參與運動與練習。	1	2	3	4
2. 我將新的技巧練的很熟，且可以做的很好。	1	2	3	4
3. 我可以做到一些動作，那些是我以前沒有做過的或做到的。	1	2	3	4
4. 我很努力地去嘗試學習新的動作。	1	2	3	4
5. 我真的非常努力。	1	2	3	4
6. 有某種動機促使我想要不斷的練習。	1	2	3	4
7. 我覺得我的動作與技術非常的正確。	1	2	3	4
8. 我會表現最好的一面。	1	2	3	4
9. 我是唯一可以作到高難度之動作或技巧的人。	1	2	3	4
10.我比我的同學作的更好。	1	2	3	4
11沒有人可以像我一樣厲害，將技巧動作發揮的淋漓盡致。	1	2	3	4
12.其他同學經常做錯動作，但是我不會做錯動作。	1	2	3	4
13.我會想去擊敗同學。	1	2	3	4

14.我有很高的體育成績。	1	2	3	4
15.我認為我是最出色的人。	1	2	3	4
16.我的技巧比其他同學好。	1	2	3	4

體育學習一般自我效能量表

探討學生對一般自我效能之看法，請圈選一個最能表達你的感受的答案，並且在適當的"1234"打勾，1是非常不同意·2是不同意·3是同意、4是非常同意。感謝您的勾選。

	非常不同意	不同意	同意	非常同意
1.當我必須靜下心來作事時，我無法做到。當我必須靜下心來作事時，我無法做到。	1	2	3	4
2.當我遇到不會做的事，我會繼續嘗試，直到會做為止。	1	2	3	4
3.我很少能達成我自己所設定的重要目標。	1	2	3	4
4.完成計劃後，我能實現它。	1	2	3	4
5.我通常會在事情沒做完時就放棄了。	1	2	3	4
6.我會避免面對困難。	1	2	3	4
7.如果事情看起來很複雜，我根本不想去嘗試。	1	2	3	4
8.即使我不喜歡某事，我會堅持完成它。	1	2	3	4
9.當我決定做某事，我會立刻去做它。	1	2	3	4
10.當學習新事物時，若一開始並不成功，我會	1	2	3	4

很快就放棄。

11我無法很妥善地處理事先沒有預料到的問題。	1	2	3	4
12當新事物看起來太困難時，我會避免去學習它們。	1	2	3	4
13.失敗會使我更努力。	1	2	3	4
14.我對自己的做事能力沒有信心。	1	2	3	4
15.我很獨立。	1	2	3	4
16.遇到事情，我很容易放棄。	1	2	3	4
17.我似乎沒有能力處理生活中大部分的問題·	1	2	3	4

QUESTIONNAIRE B ((STUDENT LEARNING EXPERIENCES-IN THEIR P.E CLASS)

The following statements relate to YOUR learning experiences in the lessons of this physical education unit. Please circle the response that best reflects how true this statement is for you.(SA)Strongly Agree, (A)Agree, (D)Disagree, (SD)strongly Disagree.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. During tennis class, I set goals for my self that I intend to achieve.	1	2	3	4
2. During tennis class I need to find out what the teacher wants me to achieve.	1	2	3	4
3. The teacher always tells me clearly what I need to do to get a good mark in this unit.	1	2	3	4
4. The teacher's feedback is essential	1	2	3	4

to my learning.

5. I don't have the knowledge to understand whether I am doing things properly.	1	2	3	4
6. The teacher gives me control over how I work during physical education class.	1	2	3	4
7. In this class I am able to work out what is a good performance for me.	1	2	3	4
8. I always compare my performance against the other students in my class.	1	2	3	4
9. I have learnt how to know by myself when I am doing well.	1	2	3	4
10. I depend on the teacher to encourage me for my efforts.	1	2	3	4
11. It is important that the other students recognize my ability.	1	2	3	4
12. I am working hard in this unit to get a good grade.	1	2	3	4
13. I work with other students in order to understand the class material better.	1	2	3	4
14. I ask the teacher for help when I am struggling with a difficult skill.	1	2	3	4
15. Even if I am having trouble learning a skill, I will not ask anyone for help.	1	2	3	4

體育課學習經驗量表

本量表探討學生對體育課學習經驗之看法，請圈選一個最能表達你的感受的答案，並且在適當的"1234"打勾，1是非常不同意·2是不同意·3是同意、4是非常同意。感謝您的勾選。

	非常不同意	不同意	同意	非常同意
1.上網球課時，我想要達成自己設定的目標。	1	2	3	4
2.上網球課時，我需要知道老師期望達成的目標。	1	2	3	4
3.老師經常清楚告知，我需做何努力才可得好成績。	1	2	3	4
4上網球課時，老師的回饋是必要的。	1	2	3	4
5上網球課時，我沒有足夠知識去認知動作是否適切。	1	2	3	4
6.上網球課時，我完全由老師指導我去做動作。	1	2	3	4

7.上網球課時，我能自我調整到好的表現。	1	2	3	4
8.上網球課時，我經常與其他同學比較。	1	2	3	4
9.我學會如何自我努力。	1	2	3	4
10.我依賴老師的鼓勵而努力。	1	2	3	4
11我認為讓其他同學知道我的能力是重要的。	1	2	3	4
12.我努力學習，想獲得好成績。	1	2	3	4
13我與其他同學何合作學習，有助於瞭解課程內容。	1	2	3	4
14.當我有困難時，我會尋求老師協助。	1	2	3	4
15.即使學習技巧上有困難，我不會尋求任何人協助。	1	2	3	4

QUESTIONNAIRE-C (STUDENT SATISFACTION WITH PHYSICAL EDUCATION CLASS)

I. Please rate your satisfaction with the physical education unit you have just completed in comparison with other physical education units you have experienced Place a cross on the following scale from 1 (totally dissatisfied) to 10 (totally satisfied) to report your level of satisfaction.

1----------10

II. The following statements relate to your, feelings about your Physical Education class. Please CIRCLE the response that best show how true each statement is for you Remember there is no right or wrong answer. It is just how YOU feel.

1.	I enjoy participating in physical education class.	1 2 3 4 5 6 7 8 9 10
2.	In physical education class, I feel it is fun to work out with a group of people.	1 2 3 4 5 6 7 8 9 10
3.	After physical education class, I feel cheerful.	1 2 3 4 5 6 7 8 9 10
4.	It feels good to successfully complete the physical education lessons.	1 2 3 4 5 6 7 8 9 10
5.	The contents of the physical education lessons will be helpful and useful to me in my future life of fitness and wellness.	1 2 3 4 5 6 7 8 9 10
6.	I have lots of fun during tennis class.	1 2 3 4 5 6 7 8 9 10
7.	In physical education class, I have learned how to encourage myself and work toward my goal.	1 2 3 4 5 6 7 8 9 10
8.	Physical education class can enhance the joyfulness in my daily life.	1 2 3 4 5 6 7 8 9 10
9.	Physical education can breed a bright and buoyant personality.	1 2 3 4 5 6 7 8 9 10
10.	Physical education class can contribute to understand the importance of teamwork.	1 2 3 4 5 6 7 8 9 10
11.	I feel there should be more physical education hours in the curriculum.	1 2 3 4 5 6 7 8 9 10
12.	The contents of the physical education material and lesson are relevant to my interests.	1 2 3 4 5 6 7 8 9 10

體育課學習滿意度量表

本量表探討學生對體育課學習滿意度之看法，請圈選一個最能表達你的感受的答案，答案沒有對和錯，並且在適當的"1----------10"打勾，1是完全不滿意·10是完全滿意。感謝您的勾選。

1 我喜愛上體育課。 1 2 3 4 5 6 7 8 9 10

2 上體育課時，我感覺與同學起學習是有趣的。 1 2 3 4 5 6 7 8 9 10

3 上完體育課時，我感覺身心舒暢。 1 2 3 4 5 6 7 8 9 10

4上完體育課時，我覺得有成就感。 1 2 3 4 5 6 7 8 9 10

5我覺得體育課內容有助於未來的休閒生活。 1 2 3 4 5 6 7 8 9 10

6 在網球課中，我得到許多樂趣。 1 2 3 4 5 6 7 8 9 10

7上體育課時，我學會激勵自己達成目標。 1 2 3 4 5 6 7 8 9 10

8 體育課能增添日常生活情趣。 1 2 3 4 5 6 7 8 9 10

9 體育課能培養樂觀開朗的個性。 1 2 3 4 5 6 7 8 9 10

10 體育課能有助於瞭解團隊合作的重要性。 1 2 3 4 5 6 7 8 9 10

11 我覺得應該增加更多的體育課時間。 1 2 3 4 5 6 7 8 9 10

12 體育課的內容符合我的興趣。 1 2 3 4 5 6 7 8 9 10

Self-regulated learning Monitoring Sheets

Self-regulated	Preparing	Implementing	Refine

Learning strategy

Goal setting	Goal	Achievement	Reason
Self-monitoring	Cognition goal	Effectiveness	Reason
Self-evaluation	Skill(C F A)	Progress	Reason
Self-reinforcement	Satisfaction	Enjoyment	Reason
Seeking help	P I	S& E	Reason

Ps. CFA=cognitive, formative and automatic. PI=personnel interaction
S & E=sharing & encouragement

自我調整學習監控表

自我調整學習	準備	實施	改進

目標設定	目標	成就	原因
自我監控	認知目標	效果	原因
自我評價	技巧(CFA)	進步度	原因
自我增強	滿意度	喜悅	理由
尋求協助	人際互動	分享鼓勵	理由

Ps. CFA=認知 形成 與自動

The tennis skill test:

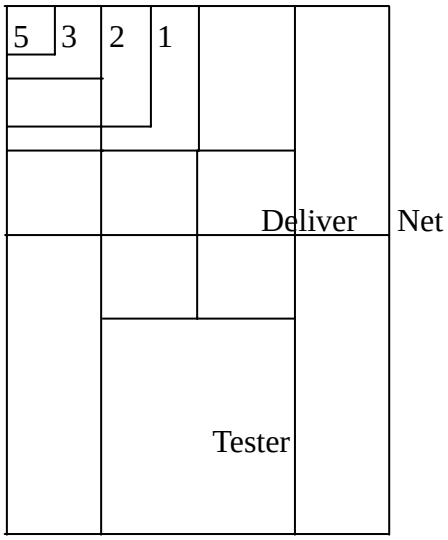
1. Test item: accuracy of stroking (forehand).

2. Place: tennis court (dividing diagonal court into four parts as the figure shown below).

3. Equipment: tennis ball, tennis racket, drawer, and measurer.

4. Method:

1. The tester stands to the right base line and hit the ball to the diagonal target.
2. Each one hits five balls and sumps up the total points.
3. When the balls fall down on the line, the recorder picks up the higher points.
4. Figure 1.



5.Assessment:

Calculated total points for five balls.

Ps: Adapted from Court Marking for Hewitt,s Forhand Drive Tests

The tennis skill test:

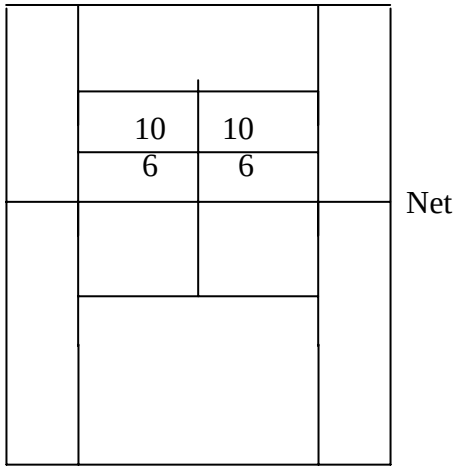
1. Test item: serve ball

2. Place: tennis court

3. Equipment: tennis ball, tennis racket, drawer, and measurer.

4. Method:

1. The tester stands to the base line (either right or left).
2. After password, serve 5 balls to the right and 5 balls to the left in the diagonal effective area.
3. Foot fault, outside, and net will not be allowed and no scoring.
4. Divided service zone into two parts and 6 points and 10 points are given.
5. Figure 1.



5. Assessment:

Calculated total points for ten balls.

Ps: Adapted from Court Marking for Hewitt,s Serve Placement Tests

Block lesson plain: strategies instructional condition for the experiment group

Part1(1'-35')	Part (36-65’)	Part3 (66'-100')

1/W (2/26)		
Introducing tennis	Grouping	SRLS introduction
2/W (3/4)		
Review SRLS Ball awareness	Introduction (forehand, Backhand, serve)	same session 2 test recording MS
3/W (3/11)		
CO: contact point/ Change weight/ flat/ racket follow through	CO: contact point/ Change weight/ flat racket follow through	CO: place ball up/ drop the racket down back / throw the racket head at the ball
ME: forehand/ backhand	ME:forehand/backhand	ME: service ball
4/W(3/18)		
CO: contact point/ Change weight/ flat racket /follow through	CO: contact point/ Change weight/ flat racket/follow through	CO: placing ball up/ drop the racket down back / throw the racket head
ME: forehand/ backhand	ME: forehand/ backhand	ME: service ball
1st Stage: Self-evaluation and monitoring		
5/W(3/25)		
Distributing MS	Peer evaluation	Peer evaluation
CO: contact point/ Change weight/ flat racket /follow through	CO: contact point/ Change weight/ flat racket/follow through	CO: placing the ball up/ drop the racket down back / throw the racket head at the ball
ME: forehand/ backhand	ME: forehand/ backhand	ME: service ball
6/W(4/1)		
Monitoring/ seeking help	Peer evaluation	Peer evaluation
CO: contact point/ Change weight/ flat racket /follow through	CO: contact point/ Change weight/ flat racket /follow through	CO: placing the ball up/ drop the racket down back / throw the racket head at the ball
ME: forehand/ backhand	ME: forehand/ backhand	ME: service ball
2nd Stage: Goal setting/ strategy plan		
7/W (4/8)		
Goal-setting/strategies plain	Refine the strategies	Refine the strategies
CO: contact point/ Change weight/ flat racket /follow through	CO: contact point/ Change weight/ flat racket /follow through	CO: placing the ball up/ drop the racket down back / throw the racket head at the ball
ME: forehand/ backhand	ME: forehand/ backhand	ME: service ball
8/W (4/15)		
Goal-setting/strategies plain	Refine the strategies	Refine the strategies
CO: contact point/ Change weight/ flat racket /follow through	CO: contact point/ Change weight/ flat racket /follow through	CO: placing the ball up/ drop the racket down back / throw the racket head at the ball
9/W (4/22) Midterm examination		
3 Stage: Strategy implementation and monitor		

10/W (4/29)		
Monitoring/evaluate effects	Peer evaluation	Refine strategies
CO: contact point/ Change weight/ flat racket /follow through	CO: contact point/ Change weight/ flat racket /follow through	CO: placing the ball up/ drop the racket down back / throw the racket head at the ball
ME: forehand/ backhand	ME: forehand/ backhand	ME: service ball
11/W (5/6)		
Small test (forehand) and feedback	Small test (forehand) and feedback	Small test (forehand) and feedback
12/W (5/13)		
Monitoring/evaluate effects	Peer evaluation	Refine strategies
CO: contact point/ Change weight/ flat racket /follow through	CO: contact point/ Change weight/ flat racket /follow through	CO: placing the ball up/ drop the racket down back / throw the racket head at the ball
ME: forehand/ backhand	ME: forehand/ backhand	ME: service ball
13/W (5/20)		
Small test (backhand)/feedback	Small test (backhand)/feedback	Small test (backhand)/feedback
14/W (5/27)		
Practicing with group	Practicing with group	Practicing with group
CO: contact point/ Change weight/ flat racket /follow through	CO: contact point/ Change weight/ flat racket /follow through	CO: placing the ball up/ drop the racket down back / throw the racket head at the ball
ME: forehand/ backhand	ME: forehand/ backhand	ME: service ball
15/W (6/3)		
Practicing with group	Practicing with group	Practicing with group
CO: contact point/ Change weight/ flat racket /follow through	ME: forehand/ backhand	CO: placing the ball up/ drop the racket down back / throw the racket head at the ball
ME: forehand/ backhand	ME: forehand/ backhand	ME: service ball
16/W (6/10)		
Skill test (forehand)	Skill test (forehand)	Skill test (forehand)
17/W (6/17)		
Skill test (service the ball)/feedback	Skill test (service the ball)/feedback	Skill test (service the ball)/feedback

SRLS: self-regulated learning strategy. MS: monitoring sheet. CO: cognitive objective
ME: main event regarding the tennis for the lesson.

Block lesson plain: curriculum instructional condition for the control group

part1(1-50’) Part2(51-100’)

1/W(2/26)Introduction tennis Ball awareness Ball awareness

2/W(3/4)Ball awareness Demonstration and interpretation (forehand)
3/W(3/11)Demonstration and interpretation (forehand)
Practicing with class in unanimity
CO: contact point/ Change weight/ flat racket ME: forehand

4/W(3/18) Demonstration and interpretation (forehand)
Practicing with class in unanimity
CO: contact point/ Change weight/ flat racket ME: forehand

5/W(3/25) Demonstration and interpretation (forehand)
Practicing with class in unanimity
CO: contact point/ Change weight/ flat racket ME: forehand

6/W(4/1)Demonstration and interpretation (backhand)
Practicing with class in unanimity
CO: contact point/ Change weight/ flat racket ME: backhand

7/W(4/8) Demonstration and interpretation (backhand)
Practicing with class in unanimity
CO: contact point/ Change weight/ flat racket ME: backhand

8/W(4/15) Demonstration and interpretation (backhand)
Practicing with class in unanimity
CO: contact point/ Change weight/ flat racket ME: backhand

9/W(4/22)Midterm examination

10/W(4/29) Demonstration and interpretation (service ball)
Practicing with class in unanimity
CO: placing the ball up/ dropping the racket down back/ throwing the racket head at the ball M E: serving the ball/review the forehand

11/W (5/6) Skill test (forehand)/ feedback

12w(5/13) Demonstration and interpretation (service ball)
Practicing with class in unanimity
CO: placing the ball up/ dropping the racket down back/ throwing the racket head at the
ball M E: service ball//review the backhand

13/W (5/20) Skill test (backhand)/feedback

14/W(5/27)Demonstration and interpretation (service ball)
Practicing with class in unanimity
CO: placing the ball up/ dropping the racket down back/ throwing the racket

head at the
ball M E: service ball//review the forehand/backhand

15/W(6/3) Demonstration and interpretation (service ball)
Practicing with class in unanimity
CO: placing the ball up/ dropping the racket down back/ throwing the racket head at the
ball. M E: service ball//review the forehand/backhand

16/W(6/10)Skill test (forehand/ backhand)and feedback

17/W(6/17)Test (service ball) and feedback
Integrated practicing and small match.

SRLS: self-regulated learning strategy. MS: monitoring sheet. CO: cognitive objective
ME: main event regarding the tennis for the lesson.

Translation of instrument

To whom it may concern:

This is to certify that I have helped Mr. Man-chih Ao to translate " Student characteristics questionnaire", " Student learning experience questionnaire", and " Student satisfaction questionnaire" into the Chinese language for the use in his thesis " The effect of the use of self-regulated learning strategies on college students' performance and satisfaction in Physical education".

When-chung Liu Chih-chiang Wang

Chung Hwa College of Medical Technology

INFORMATION FOR PARTICIPANTS

TITLE OF PROJECT: An empirical study of self-regulated learning of college students in physical education class in Taiwan

NAMES OF SUPERVISORS: DR. JOHN SAUNDERS
DR. CAROLINE SMITH
NAME OF STUDENT RESEARCHER: MR. MAN-CHIH AO

Dear Participant:

You are invited to participate in a physical education study. The purpose of this study is to explore the relationship between self-regulated learning pedagogy and successful outcomes for physical education classes.

You will be invited to complete three questionnaires, each of which might take you 20 minutes. The first one will be about some of your characteristics with which you approach your learning in physical education classes. The second questionnaire will be about how you experience the learning strategies in your unit. The third questionnaire will ask about your satisfaction with the unit. A number to enable the three sets of replies to be matched with each other will at first identify your responses. Once the data have all been keyed into the computer your identifying number will be destroyed and all your responses will be confidential. The research data collected may be published or given to other researchers. No personal details will be required.

The information you provide will give valuable insights into the needs of students who are beginning their university studies and the way they are experiencing their learning. It will be particularly useful in helping lecturers and academic skills advisers to meet these needs more effectively.

The research data collected may be published or shared with other researchers. No personal details will be required and the only other information recorded will be the course or courses in which they are enrolled.

As a participant in the study, you are free to withdraw your consent to be interviewed and to discontinue participation at any time without giving a reason. It is important to note that any withdrawal from the research will not in any way prejudice your future care or academic progress in the module.

Any questions regarding this project can be directed to Man-Chih Ao on 886 (+6) 2362714 in the Health Care Administration Department, Chung-Hwa College of Medical Technology, 51, Wen-Hwa First Street, Jen De Hsiang, Tainan Hsieng, Taiwan, 717 and/or Dr John Saunders on 61 (+3) 9953 3038 in the Faculty of Health Sciences, St. Patrick's Campus, 115 Victoria Parade, Fitzroy, Victoria, 3065.

This study has been approved by the Human Research Ethics Committee at the Australian Catholic University.

In the event that you have any complaint about the way you have been treated during the study, or a query that the investigator has not been able to satisfy, you may write to the Ethics Committee at the following address:

Chair, Human Research Ethics Committee
C/o Research Services, Australian Catholic University
Melbourne Campus, Locked Bag 4115
FITZROY VIC 3065
Tel: 03 9953 3157, Fax: 03 9953 3315

Any complaints will be treated in confidence, investigated fully and the participant informed of the outcome. If you agree to participate in this study, you need to sign both copies of the Informed Consent form, retain one copy for your records and return the other copy to the investigator.

SIGNATURE OF SUPERVISOR:

DATE:

SIGNATURE OF RESEARCHER:

DATE:

CONSENT FORM

TITLE OF PROJECT: An empirical study of self-regulated learning of college student in physical education class in Taiwan

NAMES OF SUPERVISORS: DR. JHON SUNDERS
DR.SMITH CAROLINE

NAME OF STUDENT RESEARCHER: MR. MAN- CHIH AO

I …… (the participant) have read (or have had read to me) and understood the information provided in the Letter to Participants. Any questions I have asked have been answered to my satisfaction. I agree to participate in this activity, realizing that I can withdraw at any time. I agree that research data collected for the study may be published or may be provided to other researchers in a form that does not identify me in any way.

NAME OF PARTICIPANT:

SIGNATURE: DATE:
SIGNATURE OF SUPERVISOR: DATE:
SIGNATURE OF STUDENT RESEARCHER: DATE: