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EDITOR'S NOTE

Welcome to the second edition of JIRSEA for this year. For various unavoidable circumstances, this edition is slightly delayed. Please accept my apologies.

In this edition we have contributions from The Philippines, Jordan, Thailand and Malaysia. The main theme of these articles is *soft skills* or what some called *generic competencies* and their incorporation into mainstream university subjects in order to help graduates secure appropriate and good employment.

Although the coverage is obviously not comprehensive as there are many aspects of soft skills that need to be covered, inertia to overcome, acceptance of the new additions to long held tradition in education to espouse and so on.

Some of the articles touched upon a wider aspect than just soft skills and their implementation. It is inevitable that in infusing changes the organization's management holds a pivotal role in its success. Mashitoh et al illustrated the practical challenges of change that face management. It is also instructive to note from that article the myriad of little things that seemed to have been glossed over in the preparation for change in this case, something that appears to be typical whenever management is not capable.

Thanawan and Punchalee discuss one of the potential tools to help not only in assimilating soft skills into mainstream subjects, but in changing attitudes. They advocated teaching English as a Foreign Language through *theme-based grammar instruction*. It is no longer learning English for the sake of learning English but learning English to enhance learning itself.

Other papers in this edition discuss other potential tools such as computer simulation, and all are geared towards enhancing understanding of cognitive learning.

At this juncture I wish to thank all our contributors to this issue and the various *anonymous* reviewers who had given their time ensuring the quality of this journal.

Happy reading!

Nirwan Idrus

Editor

PROMOTING DEVELOPMENTAL OUTCOMES FOR CHILDREN-IN-CONFLICT WITH THE LAW: THE DLSU-D FRAMEWORK

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Abstract

Universities are heeding to the call of its social responsibility by doing its role in value formation of the students who are formally enrolled in the institution and those who are out of school but have been deprived of decent and normal life. They are those who have serious behavioral and emotional difficulties, and their upbringing and family situation are often problematic. This paper presents a framework on how De La Salle University-Dasmariñas (DLSU-D) can intervene to improve the physical, social, emotional, mental, moral, economic, and spiritual life of the children-in-conflict with the law (CICL) in Cavite, Philippines. Some literatures are reviewed to provide inputs to the framework. A collaborative effort with the government and civil society partners is seen to be an effective strategy to achieve the goals. It is believed that DLSU-D could best respond to the challenges while maintaining its main values and goals of touching the minds, touching the hearts, and transforming the lives of the youth. It is hoped that through this framework, DLSU-D will be able to effectively sustain its mandate of promoting Christian values, life skills, and livelihood skills to its constituents. Improving their lives will increase their productive capacity which will positively contribute in the development of their communities.

Keywords: Children-in-conflict with the law, youth offenders, developmental outcomes, residents, value formation

Introduction

In the Philippines, society's concern for children is very evident in the large collection of literature on their situation, issues and concerns, and development. The best interest of the children has been one of the major concerns in the creation of programs that incorporate systematic attempts to bring about personality and attitudinal changes, specifically, in moral standards; emotional stability and self-control, tolerance for frustration, and in self-concept.

In the 2000 Census of the Philippine population, the youth, aged 10 to 24 years old, formed 32 percent of the 76.5 million Filipinos. With this population, a total of 5,825,425 children and youth are at risk, comprising 3,000,000 children with disabilities, 246,011 street children, 64,000 victims of armed conflict, 2,400,000 who are exposed to hazardous working conditions, 4,097 sexually abused, 11,317 children in conflict with the law, 3,694 abandoned and neglected, and 100,000 commercial sexually exploited (Leones, 2006).

The increasing number of youth-in-conflict with the law in the Philippines has been quite alarming. "Child in Conflict with the Law" refers to a "child who is alleged of having committed an offense under Philippine laws" or "anyone under 18 who comes into contact with the justice system as a result of being suspected or accused of committing an offense" (Republic Act 9344, 2006). Among those considered "high-risk" are abandoned and neglected children who have not been taken in by existing Department of Social Welfare and Development (DSWD) facilities, children deliberately used in criminal activities and children of women prostitutes. Such is the context of children who become vulnerable to circumstances where they come into conflict with the law (Save the Children UK, 2004).

There are three major agencies that provide custodial or confinement facilities and services for the youth offenders. These include the DSWD, the Bureau of Jail Management and Penology (BJMP), and the Bureau of Corrections which is under the Department of Justice. The DSWD supervises the facilities and services for 6,991 youth offenders nationwide. About 1,340 youth offenders are confined in various regional rehabilitation centers for youth nationwide while 5,651 of youth offenders are under the community-based rehabilitation program (Save the Children UK, 2004).

Because of the growing concern for delinquent youth, the Republic Act 9344, also known as the Juvenile Justice and Welfare Act of 2006, was passed establishing a comprehensive juvenile justice and welfare system and creating the Juvenile Justice and Welfare Council. It covers the different stages involving children at risk and children in conflict with the law from prevention to rehabilitation and reintegration.

The increasing number of CICL is not only true in the Philippines but in other countries as well. International standards require countries to promote the establishment of laws, procedures, authorities and institutions that respect the rights of children in conflict with the law and are directed towards their rehabilitation and reintegration into society. The primary instrument guiding the development of juvenile justice is the United Nations Convention on the Rights of the Child (CRC), of 1989, which has been ratified by every country in South Asia. State parties are obliged to give effect to the Convention by means of laws, policies and practices designed to further its goals (UNICEF, 2006).

The UN Convention on the Rights of the child (1989) emphasized that the "best interest of the child" must always be the primary consideration in all actions undertaken by any public or private

institution/agency or individual concerning the child. It defines “best interest” as the “protection and care as is necessary for a child’s well-being, taking into account the rights and duties of his or her parents, legal guardians, or other individuals legally responsible for him or her, and, to this end, shall take all appropriate legislative and administrative measures”.

The De La Salle University-Dasmariñas (DLSU-D) in Cavite, Philippines is laying out the ground works to fully operationalize the Bahay Pag-asa Youth Center (BPYC). This is anchored in its mandate of promoting sustainable outreach projects catering to the needs of the youth and other beneficiaries not only in Cavite but in the whole region as well. Along with this mandate, one of the University’s goals is to promote Christian (La Sallian spiritual formation) values, life skills, and livelihood skills to its constituents. The University has been playing a meaningful role in improving the quality of life of young and adults in the service areas and provide them with equal opportunities to develop their human capacities. The growing concern of the University on youth development specifically involves social protection of the most vulnerable sector and communities through social welfare and assistance. The University firmly believes that improving their lives will increase their productive capacity and indirectly their communities gain.

This paper sets out a model or framework on how DLSU-D can play a major role in improving the physical, social, emotional, mental, moral, economic, and spiritual life of the CICL. Some literatures are utilized to gain insights and to provide inputs to the framework.

Related Literature on the situation of children in conflict with the law

Much has been written about the CICL not only in the Philippines but in other countries as well using various methodologies such as face-to-face interviews to surveying of secondary data and case studies. In the Philippines, some of the studies and researches were limited to specific cities in Metro Manila while others had a nation-wide coverage. This section summarizes the studies involving CICL which will give direction on the framework that this paper hopes to accomplish.

The Division of Research and Law Reform of the University of the Philippines (UP) Law Center conducted a Socio-Legal Research Project on Youthful Offenders from 1979 to 1981. Data were obtained from the Juvenile and Domestic Relations Courts (JDRCs) project, detention centers and jails in Manila, Quezon City, Caloocan, Pasay, Makati, Pasig, and Valenzuela. About 323 children’s cases were categorized and analyzed. A UNICEF-commissioned study entitled “Situation Analysis on Children in Conflict with the Law and Juvenile Justice System,” conducted by the Ateneo Law School in 1997, influence. revealed that the Filipino child in conflict with the law is usually male; between the ages of 14 and 17; elementary graduate, middle child from a low-income family with four to six members; charged with property-related crimes (robbery and theft) and, exposed to drugs or gang.

Carlota, S. and Carlota, A. (1983) highlighted on the legal and psychological problems of juvenile delinquency in Metro Manila. They identified the probable psychological causes of juvenile delinquency; determined the intellectual and personality profiles of juvenile delinquents; and suggested criteria for the evaluation of the efficacy of treatment programs of rehabilitation centers. One of their recommendations is the creation of a program that incorporates systematic attempts to bring about personality and attitudinal changes, specifically, in moral standards; emotional stability and self-control, tolerance for frustration, and in self-concept.

The crimes committed by Filipino youth offenders include both index and non-index crimes. Statistics from the Department of Social Welfare and Development (DSWD) showed that crimes against property, including theft, robbery, qualified theft and carnapping, represent the majority of the cases. From 1995 to 2003, over 50,000 children in the Philippines have been arrested and detained. About 28 children get arrested every day, or more than one child for every hour. In many prisons and institutions, they are often denied the right to medical care, education, and individual development. They are detained in a small (3m X 7m approx.) unventilated concrete cell. Their cell is in a block containing over a hundred convicted adult prisoners. There are no beddings or basic sanitary items supplied by the jail. Children are reported to be underfed and hungry and diagnosed of having hepatitis and TB. They are often sexually abused by other adult inmates or prison authorities and are sold as child prostitutes. They have been detained for months without charges, legal counsel or any regard for their legal rights. No arrest warrants were issued at the time of their arrest and no court order was given for their detention. None of these children has been provided with competent legal counsel, as required by Philippine law (Preda Foundation, Inc., 2002). In contrast, the Singapore Children's Society (2005) noted that the CICL in Singapore have basic needs for their healthy growth and development. These include food and nutrition, safety, a nurturing environment, protection from harm, secure emotional ties, and education. On May 6, 2005, there were about 2,100 children in jails across the Philippines, 20 of them on death row (De La Cruz, 2004).

The most common types of offenses committed by the CICL in Cebu are offenses against property, drug-related offenses, and sexual offenses. They usually turn to drugs to forget about their problems or reduce their fear of committing other crimes. They also buy, sell and use other more potent and expensive drugs like shabu. For sexual offenses, the victim is also a child. Other offenses include physical injury and murder, especially when they are under the influence of drugs losing control of their emotions. These can be attributed mostly to physical abuse in the family, lack of discipline, and parental neglect (Ateneo Law School, 1998).

The most common feature among the CICL is their poor economic conditions. Ancheta-Templa (2001) describes children and youth as "victim-survivors of the socio-economically-rooted injuries of their families and communities". It was also revealed that CICL are often come from large families with 5 to 6 children, having very low income of around Php5,000 (US\$125) per month. In Davao City, children who find themselves in conflict with the law are either neglected or stow-away children from neighboring provinces. They are on the streets for survival. In many instances, these children's circumstances of "neglect" stem from impoverished conditions rather than deliberate parental neglect or abandonment (Templa et al. n.d.). The Department of Sociology of the Polytechnic University of the Philippines (1993) used the case study method and covered nine children nationwide to describe the status and situation of children in conflict with the law. They found that the most common feature among the nine children is their poor economic conditions under which they came into conflict with the law.

The presence of both parents taking care of their children proved to be very important in preventing the children from doing crimes. In cases of CICL, the fathers are usually unemployed or they are living only with their mothers. Additionally, at least 60% of CICL do not live with any parent at all when arrested. Moreover, physical and sexual abuse at home is the cause of children taking to the streets where they find "substitute families" in gangs. Gangs encourage violent behavior, theft, robbery, and more serious crimes (Mella & Tomio, 2004).

A research done by the Save the Children-UK (SC-UK) (2004) in the three main population centers in the country—Metro Manila, Cebu and Davao, representing Luzon, Visayas and Mindanao noted how much the country is in need of an organized system of diversion, including a community-based restorative justice model of mediation. They emphasized the need to ensure that all offenders should be diverted from the court process through a graduated range of

community-based options—from warning to mediation depending on the seriousness of the offence.

Community-based family support projects that alleviate poverty are not reflected in the local government budget nor do these appear in the social welfare reports of the local social welfare officers (Ateneo Human Rights Center, 2004). Hence, more than one million children worldwide detained by law enforcement officials are often denied the right to medical care, education and individual development.

Because of the very depressing conditions of the CICL, Carlota, S. and Carlota, A. (1983) recommended the creation of a program that incorporates systematic attempts to bring about personality and attitudinal changes, specifically, in moral standards; emotional stability and self-control, tolerance for frustration; and in self-concept. Likewise, the Singapore Children's Society (2005) asserted that the children have basic needs for their healthy growth and development. These include food and nutrition, safety, a nurturing environment, protection from harm, secure emotional ties, and education. They should be provided with a strong and healthy foundation for life. Services and programs must, therefore, promote and support the child's physical, social, emotional and intellectual development, functioning, and well-being.

From the foregoing, it can be deduced that while the primary and most important pillar of the justice system is the community, its responses to issues relating to CICL remain inadequate. There is a need, therefore, for an intervention by an academic institution, as part of its social responsibility, as a means of providing options towards the best interest of the child and along the principles of restorative justice.

Framework for promoting developmental outcomes for children-in-conflict with the law

Educational institutions occupy a central position in the development of any society. They should not only be more conscious of their roles in providing the youth with good quality education but should also fulfil their mission in transforming their lives to evolve and contribute meaningfully. Such transformation could only take place, however, when these institutions are imbued with the Christian spirit.

To help young people transform into responsible and productive citizens, Mercy Corps (2012) provides a framework that includes the establishment of assets transformation (Figure 1). This requires engaging youths in economic, civic, and social activities that foster livelihoods, political participation and youth-to-youth connections that can prevent risky behaviours while fostering positive youth development. To minimize the risks or consequences of conflict, poverty and injustice, young people must develop relevant knowledge, skills, attitudes and behaviors (i.e. capabilities). Young people should be aware of their roles and responsibilities in the world. Hence, they should be provided with academic/ vocational skills and life and soft skills to take care of their health, make informed decisions, develop relationships, solve problems, and the like. Moreover, they have to learn, to express themselves, and to interact in structured settings to improve their self-confidence and intra-personal skills, which increases their ability to contribute productively to their development and that of their community. Mercy Corps recognizes the insufficient opportunities to develop/utilize relevant knowledge, skills, attitudes, and behaviours effectively, especially in the developing countries. Therefore, mercy Corps creates linkages and relationships among civil society, government, and the private sector to optimize synergies that

benefit youth in short and long term. Institutional support, therefore, is very critical to address the needs in the youth transformation. Universities can play a pivotal new role in addressing the youth social problems.



Figure 1. Mercy Corps Youth Transformation Framework

Current efforts are geared towards the institutionalization of DLSU-D-Bahay Pag-asa, a facility that will provide support systems for holistic transformation of the CICL. Bahay Pag-asa is the university's response to the call to provide hope for CICL. It is a transformative facility established by DLSU-D and De La Salle Health Sciences Institute, in partnership with PLDT Smart Foundation. It seeks to introduce reforms in the administration of justice for CICL at the institutional level based on the principles as provided for in the Republic Act 9344. Various programs shall be provided for the purposes of intervention and diversion, as well as rehabilitation of the CICL, for reintegration into his/her family and/or community. DLSU-D believes that protection for CICL can be effected through diversion at the community, police, and prosecutors' level in the administration of justice. This is aimed at minimizing the CICL's entry into the criminal justice system.

Figure 2 presents the framework for DLSU-D Bahay Pag-asa designed to administer a holistic transformation program for CICL to improve their physical, social, emotional, mental, moral, economic, and spiritual life.

Maximizing Residents' Engagement and Participation in Various Program Components

Residents should have compelling reasons to stay in the Center for rehabilitation and transformation. They are expected to show maximum commitment and determination to change through a package of programs such as (a) spiritual formation; (b) basic education (academic, non-academic, and sports development); (c) livelihood skills training; (d) and post release.

The spiritual formation component involves spiritual and moral development of youth offenders through the inculcation and putting into practice the Christian way of life. The activities shall

include structured catechetical classes, Sunday masses, morning and evening prayers, recollections, and other special services.

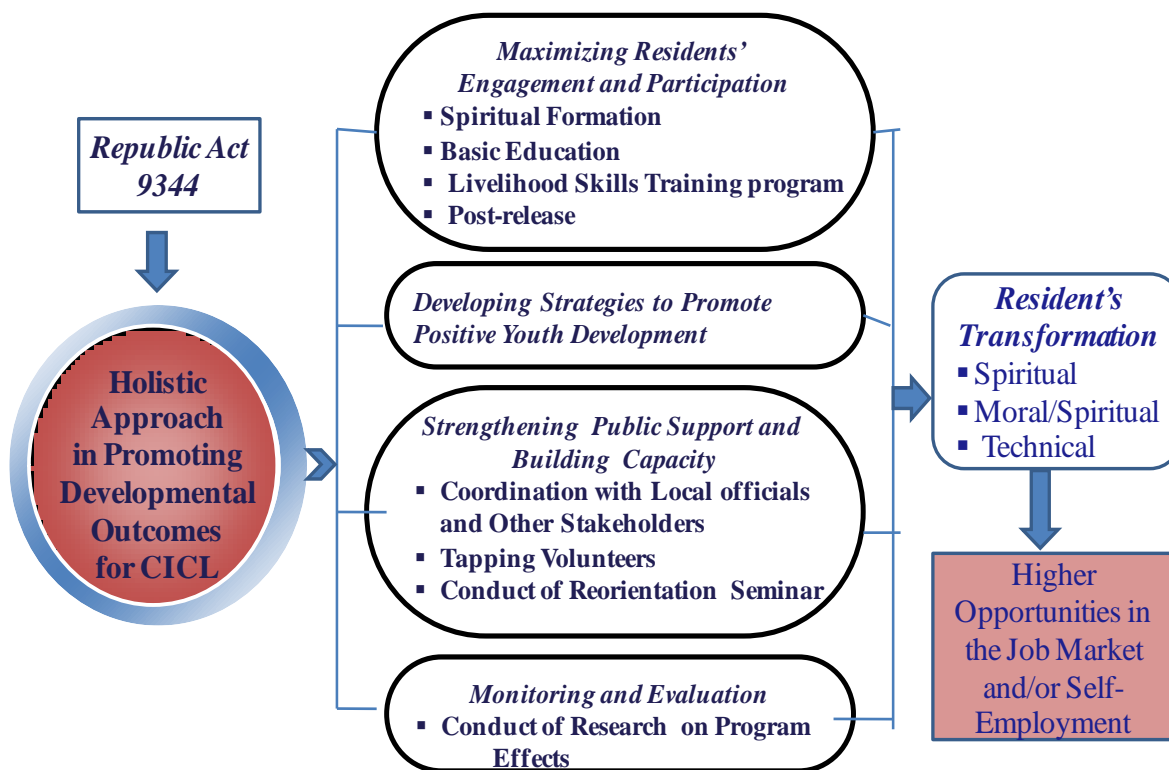


Figure 2. DLSU-D Bahay Pag-asa Framework on Promoting Developmental Outcomes for Children-in-Conflict With the Law

The basic education sessions are designed for residents who basically have no formal to low level of schooling (Grade 0 to Grade 3). The basic education activities will include remedial reading, writing, simple arithmetic, and science. The knowledge advancement activity is a more advanced formal educational training. The residents will take formal classes in Mathematics, English, Science, Filipino, and Social Studies. The faculty members are volunteers from DLSU-D and other institutions in the locality. For non-academic activities, the residents will be given the chance to harness their potentials in arts such as music, dances, acting, painting, and other cultural activities. They will also be given the free hand to form organizations and engage in other extracurricular activities.

While in the Center, the residents are provided with the opportunity to be trained to gain skills on income generating activities. The livelihood skills training programs will provide sufficient skills for the residents to practice a particular craft or sets of crafts to prepare them for gainful or self-employment. The trainings will be on product development and business management. The residents will be immersed in opportunities which would benefit them once they are released from the Center. The training areas are on garments, tailoring, backyard gardening/landscaping, candle making, automotive mechanic, poultry and livestock raising, soap making, high-speed

sewing, basic electronics, refrigeration and air-conditioning carpentry/cabinetry, Christmas decors making, engraving, framing, and food processing.

Post-release programs are essential in assisting offenders to re-establish themselves within the wider society. The matters that may ultimately lead to imprisonment may be unresolved and are still capable of influencing the life of the newly released offender. Hence, the Center should provide the support services and networks necessary to monitor the progress of the residents once they are released from the Center.

These can be realized through parent education, family counselling, home visitations, formation of cooperative learning groups and peer support groups, annual homecomings, continuous legal assistance, job referrals and placements, scholarship grants to the qualified, and guardianship for the orphaned, homeless, or abandoned. Part of the post-release program could be the alternative schools to help them further their academic skills and secure employment.

Community-based support services are designed to strengthen family life. These are provided to those reunited with their families/guardians from the evacuation/ rehabilitation centers in order to facilitate the child's readjustment and reintegration into his family and the community.

The post-release program should be reinforced by family, peers, and the community. This is a major challenge because community norms may not value the skills and behaviors young people are trying to adopt, and many of the CICL come from poor families. This suggests the importance of providing guidance and moral support, reinforce progress, and help them recognize opportunities in the job market and beyond.

Developing Strategies to Promote Positive Youth Development

In the Center, there should be a presence of caring, committed adults who will provide moral and emotional support. There should be a personal, family-like atmosphere, a sense of camaraderie with peers and staff, and a sense of belonging.

Strategies must be developed to increase positive engagement of residents in several programs including social integration, skills building, inculcating a sense of belonging, and incorporating the elements that seem to drive the success of the most effective youth programs. These will lead to the development of their leadership skills, self-esteem, and resiliency to derive the best from their peer cultures and resist negative influences.

Strengthening Public Support and Building Capacity

To further improve the services to the residents, active participation of the government and non-government organizations (NGOs) shall be strengthened. There is a need to coordinate with local officials and other stakeholders to develop clear, compelling goals. Recognizing the need for public and private sectors' support, a strong commitment from the volunteers must also be obtained. Trainers and resource persons will be sourced from DLSU-D, Technology Skills Development Authority (TESDA), Department of Trade and Industry (DTI), and other institutions/agencies. Local government units and other benevolent donors shall also be tapped for funding commitments to improve the facilities of the Center and to meet the needs for food, clothing, footwear, transportation assistance, school supplies, and medicines.

An orientation or a reorientation seminar/workshop has to be designed from time to time for members of the PNP, social workers from the DSWD, officials from the barangays, or the LGUs so that going about the rather holistic approach to dealing with children in conflict with the law will at least be in accordance with the very conceptual framework upon which the law is built. Technical assistance from the DSWD relative to the implementation of the services and projects shall be sought.

Monitoring and Evaluation

A monitoring and evaluation component must be in place to build a record of effective approaches in promoting development outcomes for the residents. Research can also be done to study impacts of the program. Gathering evidences on the effects of program components will support the broader goal of increasing the commitment of the university to continuously address the problems of the CICL.

Organization and Management

The DLSU-D Bahay Pag-asa is proposed to be supervised by the College of Criminal Justice Education (CCJE) which is under the Office of the Vice Chancellor for Academic and Research (VCAR) (Figure 3). [19]. Its direct supervision shall be under the Dean of CCJE who will at the same time be the Director. It will become a laboratory of the CCJE and the Department of Paediatrics of the DLSU Medical Center.

The training on livelihood skills will be coordinated with the Livelihood and Enterprise Development Center (LEDC), College of Business Administration and Accountancy (CBAA) of the University, and government agencies like Technical Education and Skills Development Authority (TESDA), Department of Science and Technology (DOST), Department of Trade and Industry (DTI), and the Local Government Units (LGUs).

The Bahay Pag-asa Director will oversee the operation of all project components. S/he shall be assisted by an Administrative Assistant and the Resident Supervisor. The Resident Supervisor will manage the house prefects, cook, and security staff of the Bahay Pag-asa. These staff shall be hired and paid on a fulltime basis. The Administrative Assistant will handle the faculty volunteers, foster parents, physician, and legal counsel who will work pro bono either from DLSU-D or DLS-HIS campuses. Also, under the Director are the House Prefect, Spiritual Adviser/Chaplain, and Counsellor.

The full swing operation of the Bahay Pag-asa will start in early 2012. During the period under study, facilities of the Bahay Pag-asa are nearing completion. Initial planning and coordination with the concerned agencies and institutions such as the Department of Social Welfare and Development, Local Government Units, Regional Trial Court, academic institutions, and the like as well as screening and evaluation of qualified residents are being conducted.

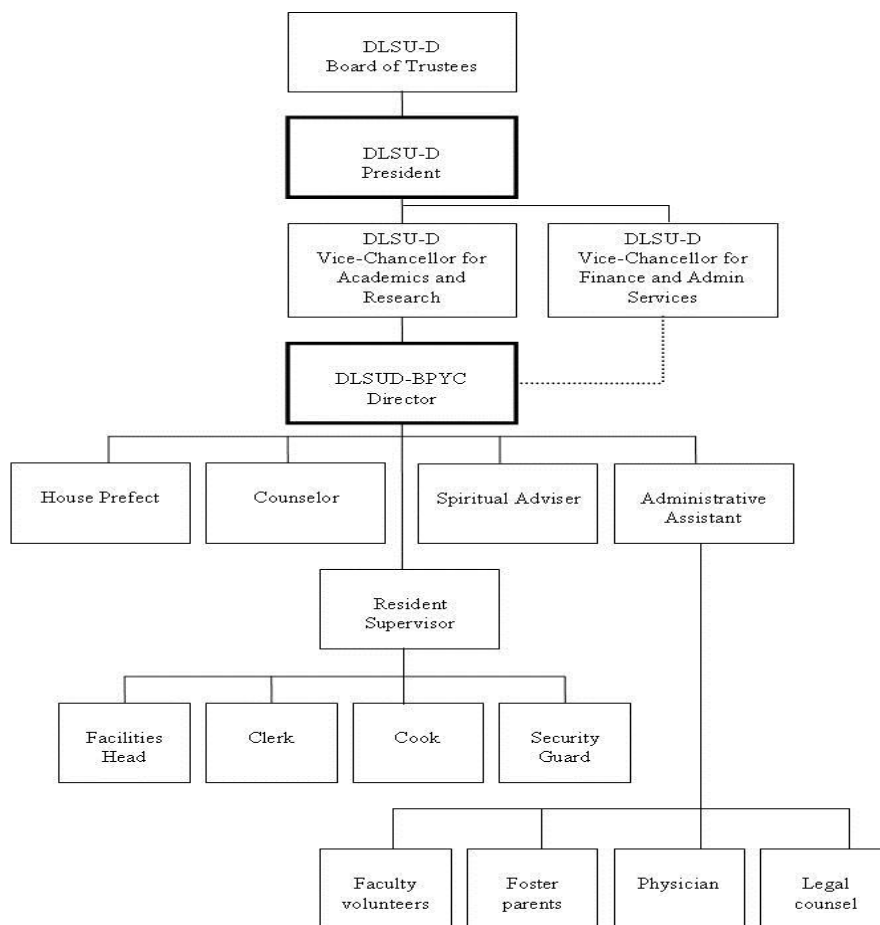


Figure 3. Proposed organizational structure of DLSU-D Bahay Pag-asa

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CRITICAL THINKING SKILLS AMONG POSTGRADUATE UNIVERSITY STUDENTS IN JORDAN

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Abstract

This study aimed at examining the degree of possession of critical thinking skills among postgraduate university students at Yarmouk University in Jordan. A purposive sample of 53 students was chosen for the study during the second semester of the academic year 2011-2012. A valid and reliable instrument named the California Critical Thinking Skills Test was used to achieve the primary purpose of the study. The results of the study indicated that graduate students under study possess critical thinking skills below the pedagogically accepted level of 80% with no statistically significant differences being detected among them due to gender or qualification. In the light of such findings, a number of recommendations were suggested for the field of the study.

Keywords: Critical thinking, Skills, California test, Postgraduate Students, and Jordan.

Introduction

Critical thinking (CT) is one of man's most significant mental activities that is of an aid to develop the human march on this planet. It has been receiving interest since the early 20th century as a scientifically cognitive field, just as shown in the writings of John Dewey mainly in 1910-1939, where he used terms like 'Reflective Thinking' and 'Inquiry' and called for human liberation from mental effort in thinking, particularly in his book *Democracy and Education*. A broader sense of the term 'Critical Thinking' was developed afterward—mainly in 1940-1960 by Edward Glasser so as to entail 'item testing'.

Based on the importance of CT, many calls have emerged for how necessary schools should generally pay attention to it. Education not only aims at exchanging expertise and information

between teachers and learners, but also to develop the learner's various mental abilities to help him/her keep in line with the immediate progress of knowledge and technology. Hence, CT is an important life skill for people today, teachers need to model CT skills to their students and explicitly teach them to think critically. Teachers can be transformed in their teaching and students can be transformed in their learning through continued, consistent use and application of CT skills (Cheryl, 2005).

Having reviewed the educational literature, we found several definitions of the term critical thinking—or CT as just used in this paper—due to the various theoretical perspectives of authors. The CT frame traces its roots in analytic philosophy and dates back over 2,500 years. The one sense of the term 'critical' means *crucial*; a second sense derives from Latin *criticus* or Greek *kritikos* with the meaning of *discerning judgment*. Let us herein state in general that CT is defined as:

- * a set of mental processes and strategies that learners employ to solve problems, make decisions and learn new concepts (Sternberg & Williams, 2004);
- * a mental process that aims at assessing one's thinking products on the basis of having right evidences, evaluating causes and developing reasonable pretenses (Gunn, 1993);
- * a rational manner of thinking that entails analysis, contemplation and imagination, is based on causes with self-made evaluation and direction and concerns with making decisions upon what one believes in with what this all involves of inquiries, hypotheses, alternatives and primary plans (Elkins, 1999; Jarwan, 2007; Norris, 1985);
- * a set of skills that one can use for defining remedies, selecting facts and specifying problems (Giroux, 1978); and
- * a set of skills and processes with a continuous attempt to test facts or opinions in light of certain evidences and then reach reliably tested results within a medium of objective discussion (Watson & Glaser, 1980);

In light of the differences that one can obviously notice in addressing the CT concept by many authors, a number of common factors exist. CT is neither a skills of decision-making nor problem-solving. It cannot be also subject to a specific strategy (or a certain order of skills) to process any situation; it requires a judgment to be made by the one who practices it using individually or collectively the rules of logic and reasoning. CT is not similar, as some educators might consider, to logical reasoning, decision-making or problem-solving or even to the higher order thinking skills stated in Bloom's (1956) Taxonomy of Educational Objectives. Such a comparison has led some teachers to believe that they teach their students CT skills when they are to put emphasis on problem-solving strategies. In fact, CT is:

[...purposeful, self-regulatory judgment, which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological or contextual consideration that this judgment is based upon (Facione, 1990; p. 2)].

Critical thinking is an important topic coming in harmony with changes in the modern world, with transformations and immense advancement of knowledge. It will certainly be even more important as we help our students acquire CT skills which will enable them to use these in

analysing, interpreting, evaluating, making inferences, defining and judging the various sorts of new knowledge.

Henry and William (1995) claimed that CT enlarges one's cognitive growth. Ellis (1997) went into more details and concluded that CT is fundamental to and forms the basic elements of communication; plays an important part in social change, helps uncover bias and prejudice, allows freedom from half-truths and deceptions, changes one point of view to another as we continue to examine and re-examine ideas that may seem obvious. In fact, critical thinkers can distinguish between facts and opinions, can ask questions, can make detailed observations, can uncover assumptions and can make assertions based on sound logic and solid evidence.

It is essential that learning CT skills is included in all curricula alongside specific CT-related educational programs. Davies (2006) affirms that a student equipped with CT skills will be able to confidently face the challenges of the future. CT is also seen as a liberating educational force, according to the APA Delphi Report (1991), and is therefore an influential resource in society and one's personal life (cf. Brookfield, 1997).

According to Ferrett (1997), a critical thinker:

“...asks pertinent questions, assesses statements and arguments, is able to admit a lack of understanding or information, has a sense of curiosity, is interested in finding new solutions, is able to clearly define a set of criteria for analyzing ideas, is willing to examine beliefs, assumptions, and opinions having them weighed them against facts, listens carefully to others and is able to give feedback, sees that critical thinking is a lifelong process of self-assessment, suspends judgment until all facts have been gathered and considered, looks for evidence to support assumption and beliefs, is able to adjust opinions when new facts are found, looks for proof, examines problems closely and is able to reject information that is incorrect or irrelevant” (Wade, 1995).

In terms of Arabic language teaching and learning, the CT skills are necessary and form a major part of the objective. Students of Arabic Curricula and Teaching Methods (CTMs) need such skills during their learning as well as when they become teachers when they need these to examine, analyse and evaluate thoughts encountered, for instance, within the given literary texts by either reading, listening, writing and speaking (Ashour & Hawamdeh, 2009). Language and thinking are strongly related; it is never advisable to separate them.

Therefore teachers play an essential role in CT development as Beyer (1987) stresses that young people should be directly guided and taught so that they can effectively employ CT skills within flexible CT situations. Teachers are instrumental in respect of CT development (Paul (1985). It is the responsibility of directors of education to support those teachers (Hunter, 1991).

Jordan has been training teachers on CT skills since 1991 and had resulted for example in the establishment of the King Abdullah II Schools for Excellence. These schools enroll brilliant students from all over the country and have as their aims and programs are to sharpen the students' personal aspects and to develop their academic preparedness and CT leadership skills (JMoE, 2003; 2005).

It is also a requirement in Jordan that teachers with postgraduate educational qualifications must provide activities that address specific mental functions and produce ideas which enhance their

students' practice of CT skills in class (Abdulhamid, 1999). Such qualified teachers are largely relied on to inspire the in-class skills of thinking, research, investigation, planning and execution. Following observations of a large number of teachers Saghir (2007) concluded that the current practice is for questions to be answered by groups and oftentimes by the teachers themselves as time is limited. Exacerbating this situation is the fact that the questions required no thinking but regurgitating what had been already memorized through repetitious actions. Naturally such situations do not develop the students' CT skills (Ashour & Hawamdeh, 2009). Indeed, what actually happens during teaching determines students' exposure to CT for such event can be either:

- **supporting**, as they enable a student to practice his or her skills and involves logical inference, pretense assessment and concept and hypothesis definition; or
- **hindering**, as they preclude that practice and results in quick (uninformed) judgment, prejudice, personal attitudes, fanciful ideas, legendary thoughts, and blind imitation (Kafafi, 2000).

Clearly, the above signals the need for a teacher who is able to provide an inspiring climate in the classroom. The research reported in this paper investigates the importance of possessing CT skills in postgraduate students of Arabic Curricula and Teaching Methods (CTMs) at Yarmouk University (YU).

Review of Literature

Ziyadat and Awamreh (2009) examined the extent to which the teachers of history within Al Salt Educational Directorate possess CT skills. The study's sample consisted of (53) male and female teachers. The results of the study revealed that history teachers' possession of CT skills were below the pedagogically accepted level averaged at around 80%. There was no statistically significant difference between genders although there is on the extent of experience or service.

Maraei and Nawfal (2007) examined CT levels among (510) students from the Faculty of Education at the university level. The CT degree among students was below the acceptable average, which was then determined at the level of (80%). The authors found a difference in the CT level according to gender in favor of females. Besides, there were differences according to the university level in favor of the first and second year students. A positive relation was also found between the student's high-school average and the CT level and another to be between the CT skills of deduction and evaluation.

Rabadi (2004) explored the effect of a CT-based training program on the degree at which the high school teachers in Jordan had possessed and practiced the CT skills. A sample of (84) teachers was selected using observational approach to respond to an instrument comprised of (25) skills covering the main five CT skills. The degree at which the subject teachers had possessed (and practiced) the CT skills was generally low (37%) with a mean of 12.60. The skill of 'analysis' came first and was followed by 'induction', 'deduction', 'inference' and lastly 'evaluation'.

Abdullat (2003) investigated the effect of a training program based on problem-based learning on the development of CT skills using the CCTST 2000. A sample of (112) tenth-grade pupils was divided into experimental and control groups. There were statistically significant differences between the two groups in favor of the experimental group whereas no differences existed due to gender, group and the interaction between gender and group.

Khraisha (2001) explored how effectively the high school teachers of *History* in Jordan assisted their students to develop CT skills. A sample of (33) teachers was selected to respond to a questionnaire. The questionnaire consisted of (55) behavioral aspects with 24 of them being CT aspects along with an in-class observation. The level of that assistance was found to be low and below the pedagogically accepted level of 85% with no statistically significant differences existed due to gender, qualification and years of experience.

Tsai (1996) investigated the attitudes of high school teachers in China toward the CT skills in *Social Studies* and how effectively they possess such skills. A sample of (11) teachers was selected and an instrument was developed to collect information about the theory and practice of CT. It was found that the teachers were uninformed of the concept of CT and that their students had not acquired the CT skills. Out of the sample chosen only (7) of the teachers were familiar with the practice of CT.

Cave (1993) attempted to specify the relationship between teaching behavior and students' CT development. A sample of (50) teachers was selected. A positive relationship was found between the quality of the teaching and the students' CT developed skills.

Wright (1988) investigated the effects of gender, age and computer literacy on the development CT ability. A sample of (263) students was selected from University of Nebraska in the USA. No effects of gender were found on CT ability.

Following this review, the authors found that few if any studies explored and examined the degree by which the postgraduate students of Arabic CTMs at YU possess CT skills. Making use of this literature in terms of the research instrument of the CCTST and the subject population, the present paper came to give a step forward in this CT field of research; it confirmed what the previous studies concluded regarding the importance of CT skills unto a new particular sample of students.

The critical thinking skills for post-graduate students have been selected with the following assumptions:

- Critical thinking skills are acquired through organized learning starting from the basic thinking skills to the higher thinking skills. Every student can think in a critical manner if he/she has the opportunity to be trained on and to practice the same. Critical thinking is a trainable and developable aspect just like any of the other thinking skills. Based on this fact, researchers have found it necessary to explore and investigate the degree at which the postgraduate students of Arabic Curricula and Teaching Methods possess critical thinking skills.
- Critical thinking by postgraduate students is an educational necessity to allow them to have the capability for research, exploration, inference and deduction in order to reach a sound conclusion in the research topics they are conducting. In fact, they need the critical mental perspectives that are deemed to be one of the essential life requirements in the age of IT revolution.
- The other is administrative in relation to the Curricula and Teaching Department at Yarmouk University that is restricted to the postgraduate students only and does not receive undergraduate students.

Problem Statement

CT skills have become as essential requirement that postgraduate students should fulfill with the aim of being equipped for the accelerating changes in all the various aspects of the modern life. In fact, the degree by which such students possess CT skills largely depends on how critically their instructors think and effectively invite their students to do so. Some studies as mostly shown above (e.g. Jaafreh & Kharabsheh, 2009; Maraai & Nawfal, 2007; Qatami & Qatami, 2000; Ziyadat, 1995) concluded CT is impeded mostly by factors such as the inferior, traditional and CT-unrelated programs in programs teaching and preparing our would-be teachers at the various faculties of education.

This paper aims at:

- a) using the CCTST 2000 to investigate the degree of CT skills possessed by postgraduate students of Arabic CTMs at YU;
- b) describing the impacts of gender on that degree in terms of any statistically significant differences among students at ($\alpha \leq 0.05$) and
- c) describing the impacts of qualifications on the same degree in terms of any statistically significant differences at ($\alpha \leq 0.05$).

It is anticipated that future benefits will accrue in curriculum planning, teaching method development and in-class and out-of-class activities.

Equally if not more important is the opportunity for the faculty members at YU involved in the unconventional thinking-based variety of education can then guide their postgraduate students of Arabic CTMs to be more active CT skills practitioners and thus develop better CT-based teaching performance when at service.

The authors hope that this paper will lead to further scholarly inquiry about CT of teachers and will enrich the educational literature with more up-to-date information in relation to CT. However, this paper is concerned with the postgraduate students of Arabic CTMs at YU who were enrolled at Semester II 2011/2012 only. Its findings were also: a) related to the type of the instrument used and b) based on both how much the subject represented the target population and how reliable the subject response was to the CCTST 2000 items.

Research Methodology

Having adopted the descriptive analytical approach, this paper concerned itself with collecting, arranging and analyzing data and information and then producing the findings and conclusions in relation to the subject problem.

Subjects: The population for this study is 53 randomly selected students from the 65 postgraduate students of Arabic CTMs at YU in Jordan who were enrolled in the second semester of the academic year 2011/2012, obtained from the Statistical Report of the Faculty of Postgraduate Studies (Table 1).

Table 1: Frequencies and Percentages of the Subject Students in Terms of Gender and Qualification

Variable	Categories	Frequencies	Percentages
Gender	Male	28	52.8
	Female	25	47.2
Qualification	Master	30	56.6
	Ph.D.	23	43.4
Total		53	100%

Instrumentation

Being available in two forms and currently one of the most frequently used tools to measure CT skills, the California Critical Thinking Skills Test (CCTST) 2000 is based on the definition of CT from the APA Delphi Report of 1990. It is a 34-item, multiple-choice test developed to measure CT skills. The test is discipline-neutral and has a target audience of college-aged individuals (Facione & Facione, 1994). In fact, the original version of the CCTST-Form B was developed by A. Facione and C. Facione in California in 1991/92. The CCTST is theoretically based on the APA Delphi consensus conceptualization of CT. A sum of 34 items contained in the CCTST are drawn from a pool of 200 items developed in a 20-year research program aiming at testing the validity and reliability of CT. Items selected for inclusion in the CCTST cover the domain of the five CT cognitive skills identified by the Delphi experts: interpretation, analysis, evaluation, explanation, and inference. Each one is a multiple-choice item designed to be dichotomously scored, with one correct answer and three or four distracters.

The CCTST measures a participant's ability to draw conclusions in the areas of analysis, inference, evaluation, deductive reasoning, and inductive reasoning (Facione, et al., 2002b) with 30 of the 34 CCTST items being classified as either inductive or deductive reasoning. The five subscales of assessment according to Facione, et al. (2002a) are:

- **Analysis** (categorizing, decoding significance, clarifying meaning, examining ideas, detecting arguments and analyzing arguments into their component elements);
- **Evaluation** (assessing claims, assessing arguments, stating results, justifying procedures and presenting arguments);
- **Inference** (querying evidence, conjecturing alternatives and drawing conclusions);
- **Deductive reasoning (Deduction)** (assumed truth of the premises purportedly necessitating the truth of conclusion) and
- **Inductive reasoning (Induction)** (an argument's conclusion being purportedly warranted, but not necessitated, by the assumed premise of truth).

Having been determined to be 0.78 to 0.80 using the Kuder-Richardson 20 Internal Reliability Coefficient, the CCTST 2000 Version was shown to correlate positively with college level grade

point average, Scholastic Aptitude math and verbal scores, and Nelson-Denny reading scores (Facione, et al., 2002b). More to the point, a Jordanian version of this instrumental test was developed by Shatnawi (2003) after it had been translated into Arabic and also made valid by:

- a) presenting it to specialists of measurement and assessment and educational psychology as all approved the strong correlation between the items and the CT to-be-measured skills;
- b) applying it to a pilot sample of 50 students with the correlation coefficient between their test scores and aggregate averages being 0.67; and
- c) counting the correlation coefficient between the total test score and the CT test sub-scores with all being significantly of $\alpha \leq 0.05$ ranging 0.51-0.88. The test was also made reliable by counting the Alpha-Cronbach (0.86) and the reliability coefficient using the split-half Spearman Brown equation (0.88). The test was applied to a randomly-selected 'adaptation' sample of 1,485 students; Muata University was randomly chosen with the sections of Humanities and Sciences at the Faculty of Education (Shatnawi, 2003).

The validity and reliability coefficients that were obtained for the present instrument—either the original ones or the ones that had been modified to suit our Jordanian environment—were all effective research indices approving the CCTST for the specified case of measurement.

Results and Discussion

Degree of Possession of CT Skills

For examining the degree at which the postgraduate students of Arabic CTMs at YU possess CT skills, the means and standard deviations were drawn out for the response of the subject sample to the CCTST 2000 as shown in Table 2 below:

Table 2: Means and Standard Deviations Pedagogically Accepted for the Subject Students' CT Skills Using the CCTST 2000

CT Skill	N.	Mean	Standard Deviation	Rank	Pedagogically Accepted Medium 80%
Analysis	6	2.566	1.2482	4	4.8
Evaluation	6	2.867	1.1608	3	4.8
Inference	12	6.000	1.8187	1	9.6
Deduction	4	1.679	1.1397	5	3.2
Induction	6	2.886	1.2505	2	4.8
Total	34	16.000	4.0000		27.2

As shown in Table 2 above, the CT skills of the subject students were below the pedagogically accepted level of 80%, along with a total mean and standard deviation to be 16.000 and 4.0000 respectively. The 'inference' skill occupied the first rank with a mean and standard deviation to be 6.000 and 1.8187 whereas the 'deduction' skill occupied the last rank with a mean and standard deviation to be 1.679 and 1.1397. The other skills in rank order; 'induction', 'evaluation' and 'analysis' had the second, third and fourth ranks, respectively. It is noticed as well that means gathered for the CT skills in general ranged between 1.679 and 6.000, which all were below that pedagogically accepted level.

The low pedagogical level as stated above is suggested here to be best attributed to the design of the university postgraduate curricula and courses which do not encourage CT. As a result, faculty members are not using the CT skills. This is exacerbated by the difficulty to acquire and/or practice such skills. The authors also attributed this finding to the traditional teaching methods and strategies that do not challenge students to think creatively and independently. These findings are echoing results found by Ziyadat & Awamreh (2009), Maraei & Nawfal (2007), Rabadi (2004) Khraisha (2001) and Tsai (1996).

Effects of Gender on the possession of CT

In order to uncover significant differences in the possession of CT between genders, the means, standard deviations and T-test were drawn out for those subject responses to the CCTST 2000 as shown in Table 3 below:

Table 3: Means, Standard Deviations and T-Test for Differences among the CCTST 2000 Responses due to Gender

Skill/Gender		N.	Mean	Standard Deviation	T.	Sig.
Analysis	Male	28	2.5000	1.20185	.404	.688
	Female	25	2.6400	1.31909		
Evaluation	Male	28	2.7500	1.32288	.780	.439
	Female	25	3.0000	.95743		
Inference	Male	28	6.0000	1.76383	.000	1.000
	Female	25	6.0000	1.91485		
Deduction	Male	28	1.4286	1.10315	1.727	.090
	Female	25	1.9600	1.13578		
Induction	Male	28	2.7857	1.28689	.619	.539
	Female	25	3.0000	1.22474		
Total	Male	28	15.4643	4.23812	1.033	.307
	Female	25	16.6000	3.70810		

As seen in Table 3 above, no statistically significant differences exist in the means of the subject responses to the CT skills and the total CT test due to genders. The t-value was calculated to be 1.033, which is not statistically significant at $\alpha \leq 0.05$. This all means that the possession of CT in postgraduate students of Arabic CTMs at YU is independent of gender.

Effects of Qualifications on the possession CT

In order to find out if qualifications affect the possession of CT the means, standard deviations and T-test were extracted from the CCTST 2000 for those subject responses as shown in Table 4 below:

Table 4: Means, Standard Deviations and T-Test for Differences among the CCTST 2000 Responses due to Qualification

Skill/Gender		N.	Mean	Standard Deviation	T.	Sig.
Analysis	MA	30	2.3478	1.25762	1.117	.269
	PhD	23	2.7333	1.22877		
Evaluation	MA	30	2.6522	1.18855	1.189	.240
	PhD	23	3.0333	1.11227		
Inference	MA	30	5.7826	1.62063	.759	.451
	PhD	23	6.1667	2.06610		
Deduction	MA	30	1.8696	1.16658	1.066	.292
	PhD	23	1.5333	1.09977		
Induction	MA	30	2.9130	1.16658	.133	.895
	PhD	23	2.8667	1.37883		
Total	MA	30	15.5652	3.91578	.689	.410
	PhD	23	16.3333	4.15414		

Table 4 shows that there is no significant difference in responses between those with different qualifications. The t-value was calculated to be .689, which is not statistically significant at $\alpha \leq 0.05$. this means that the possession of CT Skills by the postgraduate students of Arabic CTMs at YU is not affected by qualifications.

This result provides simplifications to the development of curricula as they do not need to consider gender differences and qualifications in developing curricula to encourage and develop CT skills. These findings are in line with the results reached by Khraisha (2001); however, they contradict the ones reached by Vaughn-Wrobel, Sullivan and Smith (1997) where the CT skills were significantly higher for those baccalaureate students who had completed another degree.

While Facione (1990) found similar results from a survey of 1196 students in four different courses at the pre-tests ($p=.366$), the results of the post-tests ($p=.016$) did show some significant differences between genders. However this observation was thought to be due to other factors such as Scholastic Aptitude Test (SAT) and Grade Point Averages (GPAs) rather than curricula or pedagogical methods use in the courses or in the way in which women and men learn critical thinking.

Recommendations

Based on the findings above and in light of the present objectives and limitations, it is recommended that:

- More attention be paid to develop the CT skills of the postgraduate students of Arabic CTMs by letting their study plans include one or more CT-related courses and providing them with interactive CT-motivating class environments;
- Provide support and continuing professional development for current and future postgraduate students in both CT and problem-solving approaches
- More effort be directed toward the development of CT standards that are appropriate to the Arab environment in general and the Jordan in particular, and

- More studies conducted to investigate CT levels of the various age groups, particularly at the early educational stages.

Finally, this paper may be used to help improve institutional research in Jordan generally and in specific institutions in particular. The findings of this study might be of help to revise the teacher preparatory programs to be developed during both the undergraduate and postgraduate stages. The findings also identified the need to pay more attention for education to focus on the acquisition of skills to deal with and produce knowledge instead of merely being the acquisition of this knowledge. There are several strategies in order to learn and gain critical thinking. The first strategy is to let teaching motivate thinking. Two fundamental elements towards CT are to provide the environment where critical thinking is encouraged and the other element is the teacher.

This requires the university teacher to provide a democratic atmosphere within the classroom, make the learning environment rich of resources and move the students to search, think and effectively take part in taking decisions and developing the various techniques of assessment.

At the same time, the university administration/management should be open, less bureaucratic and provide positive leadership.

The second strategy is to teach critical thinking explicitly by means of programs and textbooks specially designed for the development of critical thinking skills.

The third strategy is by integrating the critical thinking skills and the contents of the course..

Finally, the authors invite those in charge of postgraduate programs to explore the possibility of including the teaching of critical thinking to their postgraduate students. This may involve revising the teaching methods, techniques and strategies that have existed at the university and use modern methods which can will develop students' ability to think critically.

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INTEGRATING GENERIC COMPETENCIES (GCs) INTO UNIVERSITY'S COMPULSORY COURSES: PERSPECTIVES OF LECTURERS IN UNIVERSITI KEBANGSAAN MALAYSIA

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Abstract

The employment demand on university's graduates to have Generic Competencies (GCs) had Universiti Kebangsaan Malaysia's lecturers who teach the university's compulsory courses (i.e., Ethnic Relations, and Islamic and Asian Civilizations [TITAS]), rethink their teaching and learning methods. This paper discusses the perspectives of the lecturers on the issue of integrating GCs into the university's compulsory courses. A quantitative survey followed by a focus group discussion was conducted. Analysis of survey data shows that the lecturers were in the opinion that GCs has only partial basis for integration, and they did not think that GCs are able to be integrated into the compulsory courses or UKM has provided appropriate operational context for GCs development. They also disagreed that 'the appropriate mechanism is able to be identified by lecturers to assess students' GCs development.' The findings of the focus group discussion supported the survey data. These outcomes imply that more training in teaching and learning of GCs for the lecturers are crucially needed.

Keywords: generic competencies (GCs); basis of integration; integration ability; operational context; and mechanism of assessment

Introduction

The integration of generic competencies into Malaysian universities' curriculum is enforced by Malaysian Qualification Agency (MQA), an agency responsible for quality assurance of higher

education for both public and the private institutions. MQA bases its work on the Malaysian Qualifications Framework (MQF) to effect quality assurance of higher education. This is the reference point for the criteria and standards for national qualifications. MQF emphasizes eight domains of learning outcomes that include generic competencies (GCs), namely: (a) knowledge; (b) practical skills; (c) social skills and responsibilities; (d) values, attitude and professionalism; (e) communication, leadership and team skills; (f) problem solving and scientific skills; (g) information management and life-long learning skills; and (h) managerial and entrepreneurial skills. The aims of integrating GCs into university curricular are to: (a) support the development of personal, professional and career management skills of future graduates; and (b) improve their GCs capability and employability (Nelson, 2002; University of Sydney, 2002).

In Universiti Kebangsaan Malaysia (UKM), the responsibility of integrating GCs into university compulsory courses was put under the Centre for General Studies. Hence, the process of integrating the skills would have to be embraced by 22 lecturers of the Centre who teach the university compulsory courses. In the course of integrating the skills into the university's compulsory courses four main concerns are needed to be addressed by the lecturers to assure the success of the integration of the skills. Thus, this paper discusses the perspectives of the lecturers on the four concerns, namely: (a) the extent to which this set of competencies provide a suitable basis for integration into university courses, in that whether or not the competencies were 'naturally occurring' within the existing course structures, and whether or not methods are able to be developed to make those competencies explicitly recordable and assessable; (b) the extent to which this set of competencies can be integrated into the courses by individual lecturers during the planning, implementation, and assessment stages; (c) the appropriate operational context where the competency development is expected to occur; and (d) the appropriate mechanism to assess student's development in those competencies.

As lecturers are key players in integrating GCs into UKM's compulsory courses, as the effectiveness of the integration is dependent to a large extent on the willingness of the lecturers to integrate the skills into the university compulsory courses, it is interesting for this paper to explore the perspectives of the lecturers on the best way to address the four concerns alluded to above.

Concerns in Integrating Generic Competencies (GCs) into University Courses

The literature reviewed reveals interesting views by previous researchers on addressing the four concerns in integrating GCs into university courses, i.e., the basis of integration, integration ability, operational context, and mechanism of assessment.

The Basis of Integration

In terms of whether or not the competencies were 'naturally occurring' within the existing course structures, Hager & Holland (2006) argued that the set of competencies provide a suitable basis for integration into university courses, in that they were 'naturally occurring' within the existing university course structures. Emphasis in teaching and learning is on how people learn best and GCs are significant components of initiatives to improve teaching and learning. It requires learners to deploy some combination of GCs if they are to be successful. It is also the ones that lead to good learning outcomes. Thus, by embedding the development of generic attributes in courses we can improve learning overall. For example, it is natural for us in UKM to require learners to deploy GCs such as fluency in communicating their learning experience of Ethnic

Relations course through verbal presentation. In this case, we can see communication skill (i.e., one of the GCs) is naturally occurring in the course structures.

As for the methods to record and assess GCs, research on GCs teaching and learning methods indicates that there is a strong and recurrent link between the development of GCs by learners and methods of teaching and learning. Previous researchers suggest a strategy for explicitly assessing graduate GCs throughout the curricular utilizing a variety of assessment methods. Thus, the lecturers need to ensure that students (Hart et al., 1999): (a) experience a variety of learning experiences; (b) have structured opportunities for reflection and interaction with other students (e.g., peer consultation) throughout the course; and (c) develop profiles of their learning experiences from the commencement of their course programs. Ideally, this individual account of GCs development should be integrated as a core component of the curriculum.

Integration Ability

UKM would need a shift in the way lecturers handle the planning, implementation and assessment stages of teaching and learning to enable this set of competencies to be integrated into its compulsory university courses by the individual lecturers.

The extent to which generic competencies (GCs) are able to be integrated into UKM's compulsory courses by individual lecturers in the planning stage depends on at least four factors. For students to progressively develop GCs, firstly, a shift in teaching and learning practices from a teaching-centred and content-focused transmission model of teaching and learning, to a student-centred and process-focused constructivist model of teaching and learning, is necessary (Campbell, 2001). Secondly, it also depends on whether or not the content of the course and assessment method used matched and are appropriate. Thirdly, the skill to identify GCs to be integrated into the university courses by the individual lecturers is also important in assuring the integration ability of the GCs into such courses. Last but not least, curricular revision especially on the objectives and the learning outcomes of the courses as well as the identification of the type of students involved and resources needed (by both lecturers and students) are also essential in determining whether or not the set of GCs is able to be integrated into the courses.

At the implementation stage, the integration ability of the GCs into the courses is largely dependent on the teaching and learning methods as well as the techniques used in integrating GCs into the courses. The type of GCs addressed and the type of activities employed to integrate the GCs into the courses are also an important factor to be well considered (Mohd Safarin & Kamaruddin, 2009). The choice of either in-class activities such as classroom discussions, group works, presentations, as well as role play and simulations; or out-door activities such as field assignments, project reports, independent study, field trips and site visits will largely depend on the type of GCs to be instilled, the actual content of the course subjects, the number and type of students, the availability of resources, and the subject credit hours. Another factor that could determine the smoothness of the integration is whether or not GCs modules have been developed and used in the teaching and learning of the competencies. Such modules have been used in several developed countries. Another important factor to be considered is the type of approaches adopted to implement GCs: the diffusion or the infusion models? According to Aini Hussain et al. (2005), most higher education institutions have applied the diffusion models (or also known as scattered model) such as creative thinking, technical writing, and public speaking etc. in their curricular studies. However, the infusion model approaches is the most suitable and relevant to apply nowadays where the GCs are integrated into the course content. In addition, previous studies found that GCs courses are not very effective, particularly for university and adult

students (Hattie et al., 1996). Shahrin et al. (2009) also stated that in the initial phase of implementation stage, only some subjects are identified and ready to be deployed. This is to control the implementation stage by not over-doing the incorporation of GCs over the main contents of the course subjects.

At the assessment stage, the integration ability of the GCs depends mostly on the level at which the GCs are able to be assessed. This level is normally defined by the Bloom taxonomy. According to Shahrin et al. (2009), for the overall assessment of course subjects in relation to GCs, a substantial portion of assessment marks must be allocated in order to adequately reward the demonstration of such skills. Appropriate scores should be given to the criteria demonstrated by students to reflect their importance of effectiveness, orderliness and rank of such achievements. Presentation, participation, communication, teamwork and problem solving are considered quite easy to assess since the performance criteria are quite straight forward.

Another key factor to be considered in the assessment stage is the tools used for assessing the GCs. There are many methods that are readily available to measure the outcomes of GCs and each method has its own advantages and disadvantages. For example, peer assessment is one of the methods used in assessing team working. By using this method it will somehow relieve the burden for the lecturers in assessing GCs especially of a large number of students. However, the results of peer assessment have shown that more often than not, most of the students generally gave maximum scores to everyone in the group. Perhaps, this is due to the Malaysian cultural values of helping one another, even though it is noticed that not all members in the group really participate equally when executing given tasks. Thus, some sort of moderation and monitoring by the lecturers is necessary (Shahrin et al. (2009).

With respect to other attributes such as self esteem and integrity, Shahrin et al. (2009) found that not all courses could use peer assessment method since it is difficult to implement and assess, for example in the engineering-based subjects. As a result of this difficulty, such GCs are incorporated into the humanities, management, English language and the co-curricular courses.

Operational Context

Developing appropriate operational context for GCs in a university is vital. Outcome Based Education (OBE), the quantity and quality aspects of human resource, the infrastructures and facilities, and services such as a University Careers Office are amongst the important elements of operational context for GCs:

- (1) Outcome Based Education (OBE), which promotes student-centred learning, adopted by UKM creates appropriate operational context in that generic competencies (GCs) add a further dimension to discipline-specific discourse by providing the basis for a consistent terminology for describing course outcomes. The common lack of such consistency, in the higher education sector, means there is no agreed reference point when, for instance, lecturers attempt to develop trans-disciplinary courses (Hager & Holland, 2006).

Human resource in terms of quantity and quality are also important factors in two ways:

- (a) the implementation of GCs requires lecturers to pay attention to individual students and have an appropriate contact hour with them. This is not possible if the ratio between student and lecturer is high; and
 - (b) a qualified and well-trained lecturer is vital to infuse or integrate GCs into the curriculum.
- (2) Sufficient and GCs friendly physical infrastructure like lecture halls, seminar rooms, laboratories, etc., are important factors for providing a conducive GCs teaching and learning environment. Similarly, sufficient and fully functioning teaching aids such as computers, LCD projectors, screens, etc., are vital. Last but not least, a reliable GCs assessment system, i.e., generic competencies assessment system (in UKM, the system is known as SPKG) is also important.
- (3) University Careers Office would be an important unit in UKM if UKM is really serious about instilling GCs into its graduates so as they are marketable and employable. The Office would act as a source of information on careers and vacancies. The Office would provide curriculum vitae workshops, guidance on individual interview skills, and assistance on the cold enquiry letter to companies and prospective employers, sample of typical interview questions, and assistance on coping with difficult questions and assessors' guidelines.

Mechanism of Assessment

Two most pressing and highly needed mechanisms of assessment of GCs in UKM are academic-industry collaboration and variety in assessment methods.

The overall development of generic competencies (GCs) requires a full cooperation, participation and partnership between students, lecturers, universities and the industries. Feedbacks from industries through surveys and questionnaires to assess the impact of incorporating GCs as needed by the industries, are highly desirable to help in continual improvement and development (Shahrin et al., 2009). Meanwhile, a varied assessment method is needed to give a better and verifiable representation of the student performance. Moreover, a better mechanism should be provided to communicate and transfer GCs to the students, lecturers, university and industries in order to gain more accurate results when doing assessment. According to Hart et al. (1999), only when there are explicit links between university-and professionally-defined graduate competencies, student learning objectives, learning opportunities, and assessment strategies will there be confidence in the quality of the program as a preparation for professional practice. This resemblance is best illustrated in an individualized student profile of experience that complements the transcript of achievement. The student profile of experience facilitates the process of effectively matching individual students to specific graduate employment opportunities. It explicitly addresses the development of desired graduate GCs.

Methodology

Quantitative approach with a cross-sectional study as research design was adopted in this study as data were collected only at one point of time for the same respondents, and a quantitative survey questionnaire as research instrument was used. A set of questionnaire was distributed to all 22

lecturers who teach UKM's compulsory courses, i.e., 11 Ethnic Relations lecturers and 11 TITAS lecturers, and nine of them responded. Hence, the response rate of the lecturers is 40.9 per cent. Of the sample from the lecturers, 55.6 percent are male and 44.4 percent are female; and 100 percent are Malay Muslim. Additionally, all 22 lecturers were invited for a focus group discussion, and seven of them responded, hence focus group discussion was conducted with seven lecturers of Ethnic Relations and TITAS.

The perspectives of the lecturers on addressing the concerns in integrating GCs into university compulsory courses were tapped via the quantitative survey and focus group discussion techniques of collecting data, i.e., on

- (a) the extent to which this set of competencies provide a suitable basis for integration into UKM's compulsory courses, in that whether or not the competencies were 'naturally occurring' within the existing course structures, and whether or not methods are able to be developed to make those competencies explicitly recordable and assessable;
 - (b) the extent to which this set of competencies can be integrated into the courses by individual lecturers during the planning, implementation, and assessment stages;
 - (c) the appropriate operational context where the competency development is expected to occur; and
 - (d) the appropriate mechanism to assess student's development of those competencies.
- The survey instrument was based largely on variables found important in the literature on the issues of integrating generic competencies into university courses. Five-likert scale from 1 = strongly disagree to 5 = strongly agree was used in this study. Reliability test was conducted and resulted in the alpha coefficient was well above 0.8 for each of the variables, ranging from 0.853 to 0.884 amongst the lecturers.

Results and Discussion

This paper discusses the concerns in integrating GCs into university compulsory courses, i.e., the basis of integration, integration ability, operational context, and mechanism of assessment, from the perspectives of the lecturers who teach the courses. The results obtained provided many insights on the concerns as well as implications to assist in future efforts of integrating GCs into university courses.

The Basis of Integration

On the question of suitability of these GCs to be integrated into current courses, the majority of lecturers (55.5%) did not agree that GCs were 'naturally occurring' within the existing course structures of the compulsory courses, but the majority of them (55.5%) agree that methods are able to be developed to make those competencies explicitly recordable and assessable (Table 1).

Meanwhile, focus group discussion reveals that the lecturers frequently mention that skills like communication, information & communication technology (ICT), and team work are explicit and can be easily seen as naturally occurring in the course structures as the criteria of assessment of the courses involve presenting verbal and written research projects using power point presentation format and the projects are done in groups. However, other generic competencies like values, attitudes and life-long learning are alien to the course structures, e.g., in the learning outcomes, and the possibility of the competencies to occur naturally is almost non-existence.

Table 1: Perspectives of the Lecturers on the Basis of Integration

Statements (the Basis of Integration):	Lecturer (%)		
	Agree	Unsure	Disagree
1. Generic competencies were 'naturally occurring' within the existing course structures of Ethnic Relations and TITAS.	22.2	22.2	55.5
2. Methods are able to be developed to make generic competencies explicitly recordable and assessable.	55.5	22.2	22.2

Source: Analysis of Survey Data

This is in contrast to Hager & Holland's (2006) argument that, the competencies were 'naturally occurring' within the existing university course structures but require emphasis in their teaching and learning.

Focus group discussion with the seven lecturers reveals that the university compulsory courses were not structured to measure all the GCs. Even if the Centre for General Studies UKM wishes to re-structure the courses that way not all of the GCs are able to be put into the structures of the courses because they are too alien to the nature of the courses. If they are forced into the structure of the courses, negative impacts on the integration process and on the effectiveness of the GCs on students will occur.

While lecturers thought that methods could be developed to make those competencies explicitly recordable and assessable, Medlin et al. (2003:63) noted that "traditional university teaching methods do not implicitly result in the development of a broad range of generic [competencies]." This implies that lecturers will need to be willing to use a variety of teaching and assessment methods. This will ensure that students will:

- a. Experience a variety of learning experience
- b. Have structured opportunities to reflect and interact with other students, e.g. peer consultation throughout the course, and
- c. Develop profiles of their learning experiences from the commencement of their course programs (Hart et al 1999)

According to the focus group members, they are willing to develop a method to record and assess the GCs. Such methods could be via group projects, for instance. If social responsibility is to be measured group project given could be on solving local environmental problems. If entrepreneurship is to be measured the project assigned could be on solving issues in business corporations. However, the lecturers in the focus group discussion frequently mentioned that it is vital to identify which GCs to assess before the methods are developed to assure the methods match the GCs meant to be recorded and assessed. Although the lecturers voice out their concerns on recording and assessing GCs such as values, attitudes, team work and lifelong learning of the students they are willing to develop methods, i.e., reflection activities on daily routines and events or incidents occurred; peer review; field trips; mentor-mentee system; and pre and post diagnostic tests, to record and assess such GCs.

Integration Ability

Quantitative survey data reveals that most of the lecturers are either unsure or of the opinion that GCs are unable to be integrated by individual lecturers into Ethnic Relations and TITAS courses (Table 2). Focus group discussion discloses that lecturers have problems integrating GCs at all stages of development with implementation and assessment stages being the hardest stages of all as current course structures are not designed to integrate the GCs into the planning, implementation, and assessment stages. Additionally, the lecturers noted that items for each GCs are too many hence almost impossible to be integrated into the three stages.

Table 2: Perspectives of Lecturers on Integration Ability

Generic competencies can be integrated into Ethnic Relations and TITAS courses by individual lecturers during:	Lecturer (%)		
	Agree	Unsure	Disagree
1. Planning stage only	22.2	55.6	22.2
2. Implementation stage only	22.2	22.2	55.5
3. Assessment stage only	11.1	44.4	44.4
4. Planning & implementation stages only	22.2	44.4	33.3
5. Planning & assessment stages only	11.1	44.4	44.4
6. Implementation & assessment stages only	22.2	22.2	55.6
7. Planning, implementation & assessment stages	0	33.3	66.7

Source: Analysis of Survey Data

The focus group discussions also revealed that there is reluctance to adopt new ways of teaching and learning that would incorporate GCs. Such reluctance for the shift from traditional teaching and a new one that would incorporate GCs include:

- (1) from a teaching-centred and content-focused style of teaching and learning to a student-centred and process-focused constructivist model of teaching and learning (Campbell, 2001);
- (2) from pen and paper examination assessment method to an on-going assessment method;
- (3) from not having to work on identifying GCs to be integrated into the courses to having to work on identifying GCs to be integrated into the courses;

- (4) from not having to revise the old curriculum to having to revise the curriculum, i.e., the objectives and the learning outcomes of the courses as well as the identification of the type of students involved and resources needed by both lecturers and students;
- (5) from the traditional teaching and learning methods and techniques to, for instance, mediated instruction, i.e., the teaching and learning of the skills is supplemented with audio and visual materials (Oliva and Henson, 2001);
- (6) from lecture-based method of teaching to activity-based method of teaching (Mohd Safarin & Kamaruddin, 2009) which would raise another issue, i.e., the choice of either in-class activities such as classroom discussions, group works, presentations, as well as role play and simulations; or out-door activities such as field assignments, project reports, independent study, field trips and site visits will largely depend on the nature of GCs to be instilled, the actual content of the course subjects, the number and type of students, the availability of the resources, and the subject workload credit hours (Shahrin et al (2009);
- (7) from not having to develop GCs module to having to develop the module to be used in the teaching and learning of the competencies to provide the basic elements of instruction, i.e., objectives, learning activities, and evaluation as well as the guide to the measurement process of GCs (Krathwohl, 1974);
- (8) from not having to work on the type of approaches adopted to implement GCs to having to choose between the diffusion model, i.e., also known as scattered model such as creative thinking, technical writing, and public speaking etc (Aini Hussain et al. (2005) and the infusion model, i.e., the GCs are integrated into the course content which allow field-based experiences (i.e., real problems drawn from the physical and social environments of a community to be incorporated into the teaching and learning processes), and make the choice works for GCs bearing in mind that past studies found that GCs courses are not very effective, particularly for university and adult students (Hattie et al., 1996);
- (9) from not having to allocate a substantial portion of assessment marks for the demonstration of GCs by students to having to allocate such marks; and
- (10) from not having to identify methods used for assessing the GCs, for instance, peer assessment in assessing team working, to have to identify such assessment methods.

The implementation of GCs requires the shift in emphasis from content-driven to skill-driven curricula. Lecturers are therefore required to revise their curricula. From Table 2 it is clear that lecturers at UKM are both reluctant to do so and have not been trained to carry that out.

Operational Context

Table 3 shows that lecturers do not believe that UKM has provided the appropriate operational context where the competency development is expected to occur in terms of:

- a. the ratio between student and lecturer – as the implementation of GCs requires lecturers to attend to individual students' learning and have an appropriate contact hour with them;
- b. qualification and training for lecturers to integrate GCs into the curriculum of the courses – as the quantity and quality aspects of human resource are important;
- c. infrastructures like lecture hall, seminar room and laboratory – as they are important for providing a conducive GCs teaching and learning environment;
- d. sufficient and fully functioning teaching aids like computer, LCD projector and screen; and
- e. a reliable GCs assessment system.

Findings from the focus group discussion support the findings of the quantitative survey results. The lecturers identified the inappropriate ratio between lecturers to students as the root cause for

the inability to integrate GCs into the courses. The lecturers would prefer 30-40 students per class instead of the current average of 100 students per class to cater for new activities such as field trips, assessment of their individual GCs, etc. As for a reliable GCs assessment system, the lecturers explain that it should not mislead or unnecessarily disadvantaged students.

Table 3: Perspectives of Lecturers on Operational Context

Statements (the Operational Context):	Lecturer (%)		
	Agree	Unsure	Disagree
1. Outcome Based Education (OBE) which promotes student-centred learning creates appropriate operational context to operate the development of expected generic competencies.	22.2	55.6	22.2
2. Ratio between student and lecturer is appropriate.	0	0	100
3. Lecturers of Ethnic Relations and TITAS are well qualified and trained for integrating generic competencies into the curriculum of the courses.	22.2	0	77.8
4. Infrastructures like lecture hall, seminar room and laboratory are sufficient and appropriate for teaching and learning of generic competencies.	11.1	11.1	77.8
5. Teaching aids like computer, LCD projector and screen are sufficient and well function.	22.2	22.2	55.6
6. Assessment System of Generic Competencies (SPKG) is reliable.	0	44.4	55.5
7. UKM establishes University Careers Office.	55.5	22.2	22.2

Source: Analysis of Survey Data

In addition it was argued that students do not need to acquire all of the GCs in order to secure employability. According to the lecturers, the assessment tool is not at all effective due to too many students to be assessed using too many items per generic competency with some of them are not even relevant to the course. The lecturers suggest that the assessment system should be retooled to cater for specific GCs at specific faculties, e.g., GCs assessment system for faculty of science and technology, GCs assessment system for faculty of Islamic studies, and GCs assessment system for faculty of social sciences and humanity.

Table 3 also illustrates that the lecturers are unsure of whether or not OBE which promotes student-centred learning could create appropriate operational context to operate the development of expected GCs although according to Hager & Holland (2006) OBE provides a framework for GCs in evaluating and assessing course outcomes, and the basis for a consistent terminology for describing course outcomes. The focus group discussion reveals that although OBE is in place it is not assisting in generating and developing students' GCs mainly because the items of GCs meant to be assessed are too many, not relevant or alien to the courses, and the size of the class is too big to use the framework of OBE in assisting the development of GCs of the students.

However, the majority of lecturers are of the opinion that the University Careers Office should contribute to the appropriate operational context since it is the unit in the university that has been dealing with helping students gaining GCs to make them marketable and employable. It also provides work readiness programmes, curriculum vitae workshops, guidance on individual

interview skills, and assistance on the cold enquiry letter to companies and prospective employers, sample of typical interview questions, and assistance on coping with difficult questions and assessors' guidelines.

The focus group discussion reveals that lecturers are in support of University Careers Office, and suggest that this Office should identify students to assist in GCs needed for employability; hence, this Office should be incorporated with the Centre for General Studies UKM. The lecturers emphasize the vital role of this Office particularly since it is the first contact point for would be employers when looking for graduates to employ.

Assessment Mechanism

Table 4 shows that lecturers disagree with the statement: *'the appropriate mechanism is able to be identified by lecturers to assess student's development of those competencies.'* Lecturers do not feel that they receive full cooperation and participation from students, colleagues, and industries, and they are unsure about the feedbacks from industries let alone to have industries contribute in assessing GCs of their students via, for instance, workplace-based assessment methods such as direct observation, case-based discussion, mini-peer assessment tool, and procedure-based assessment (Beard et al., 2009).

It also means that they are not always aware of what is expected of their graduates by potential employers regarding the skills needed for employment. Hence, it is hard for them to make continual improvement and development of GCs (Shahrin et al., 2009). The focus group discussion further underlined the survey findings that lecturers prefer collaboration with industries according and relevant to the academic background of the students, that is, hospital for medical students, accounting firms for accounting students, and factories for engineering students, in assessing students' GCs. The lecturers are also concerned that the assessment mechanism of GCs employed by UKM is not comprehensive. One lecturer questioned the subsequent role of UKM when students are found with shortfalls in their GCs. What would UKM do next to ensure that this student obtained that competency by the time s/he graduated.

Table 4: Perspectives of Lecturers on Mechanism of Assessment

Statements (the Mechanism of Assessment):	Lecturer (%)		
	Agree	Unsure	Disagree
1. Lecturers received full cooperation and participation from students, colleagues, and industries.	33.3	22.2	44.4
2. Lecturers received feedbacks from industries via surveys to assess the impact from the integration of generic competencies.	0	66.7	33.3
3. Lecturers are using various student assessment methods.	77.8	11.1	11.1

Source: Analysis of Survey Data

Meanwhile, the lecturers claimed that they have made use of various student assessment methods to give a better representation of the student performance but looking at the zero "Agree" response of the lecturers on the receipt of feedbacks from industries, in Table 4, it is clear that the student assessment methods employed do not involve industries. Hence, lecturers do not receive assistance in trying to achieve one of the most important goals of GCs education, i.e., meeting employment requirements for graduates. Hart et al. (1999) and Medline et al. (2003) believed that

by bringing together experts from various stakeholders including industries would enable the revision of the assessment criteria of GCs to meet the needs of employers. While admitting that input from industries is important the lecturers who participated in the focus group discussion discloses that they should only teach the aspects of theory and concept of GCs while the assessment of GCs achieved by the students should be left to the lecturers in the faculties of the students accordingly because the faculty lecturers know the students better, hence would be able to assess the individual GCs of the students correctly before the students graduated. Additionally, they are of the opinion that each of the industries is different and requires different GCs.

Therefore, faculties know better of what GCs are expected from their faculty's graduates by the industries. The top management of the university, lecturers and representatives from industries should come together in developing university students' GCs.

Conclusion

The survey results, control group deliberations and other observations pointed to the need for vigorous training in GCs for lecturers who are to implement university decisions on this. In fact the lecturers themselves indicated through these mechanisms that they are currently not trained to integrated GCs to their respective courses.

In addition, the lecturers also refuted UKM's claims that it has provided the appropriate operational context where the competency development is expected to occur. Hence, UKM should seriously look into providing the appropriate operational context for GCs to develop and consequently meeting the goal of GCs education which is to create marketable and employable graduates. The lecturers are one of the key players in integrating GCs into university compulsory courses in UKM. Hence, the lecturers' perspectives ought to be taken into account in decisions made for every aspect of the implementation of GCs in UKM.

In addition, future research should begin with lecturers' perspectives on integrating GCs not only into compulsory university courses but also into the other university courses if the infusion method of implementing GCs is to be adopted by the university.

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EFFECTS OF THEME-BASED GRAMMAR INSTRUCTION ON THE ENHANCEMENT OF ENGLISH WRITING ABILITY OF THAI EFL STUDENTS

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Abstract

Writing is one of the important language skills for effective communication. In the classroom, students need to write several types of writing assignments both in their language class and other subject-matter classes. Meanwhile, in the workplace, employees need to develop their writing ability since it directly influences hiring decisions. Concerning the importance of writing ability, the present study chose theme-based instruction, teaching a language through content matters, as a treatment for teaching English grammar and structures, namely theme-based grammar instruction. It explored the effects of theme-based grammar instruction on the enhancement of English writing ability of Thai EFL students. To answer such an issue, twenty-seven Thai EFL undergraduate students at a public university in Nakhon Pathom Province, Thailand were recruited. The data were collected from the pre-test, post-test, and interview responses. The results showed that after the treatment, the students had improvement in their English writing ability with statistical significance ($t = 3.091$, $p = .005$). From the pre-test to post-test, grammatical errors were reduced from 122 errors to 56 errors while lexical and other writing errors decreased from 93 errors to 52 errors. The interview of the students also indicated that they had positive attitudes toward theme-based grammar instruction that helped improve their English grammatical knowledge and writing ability.

Keywords: theme-based grammar instruction, grammatical knowledge, writing ability

Introduction

Basically, the term “writing” is defined as the ability to compose and express thoughts of the writer (Anderson, Hiebert, Scott, & Wilkinson, 1985). Writing is one of the productive skills, which is needed in most contexts of life; not limited to only school, but also in the workplace and

the community (Graham & Perin, 2007). In the classrooms, students usually encounter various writing assignments both in their language class and other subject-matter classes. Meanwhile, most employees in the workplace need to develop their writing ability since it directly influences the company's hiring decisions. To respond to such various needs, writing classes are widely offered in both ESL and EFL contexts. For students, in particular, writing ability is one of the criteria the teacher can use to make prediction about their academic success (Graham & Perin, 2007). This is because writing practice encourages the use of strategies, such as planning, evaluating, and revising texts (Keys, 2000; Shanahan, 2004; Sperling & Freedman, 2001). That is to say, such strategies help students achieve a variety of learning goals like writing a report or expressing their opinions, all of which they must do when they learn a language or even other subjects.

Based on the aforementioned importance of writing ability, many types of instruction have been experimented on in writing classes including development of writing ability through grammar instruction (Hinkel, 2002a, 2004; Lorenz & Met, 1988; Santos, 1988). Such a trial is based on the belief that there is a positive connection between grammatical knowledge and writing ability (Pazaver & Wang, 2009). In other words, as a method to make a writing task easier, grammar instruction tells students to use and arrange words, phrases, and clauses appropriately and correctly. To clarify this belief, past research has found that the grammatical systems, such as conjunctions, references, and tenses have effects on writing ability since they can enable a text to show some particular kinds of meanings that contain their own functions in particular contexts (Schleppegrell, 1998). Thus, to effectively teach grammar, meaningful contexts should be provided during the instruction (Celce-Murcia, 2007; Larsen-Freeman, 2001). This is because grammar itself not only consists of rules governing form but also includes grammatical knowledge that is the knowledge of how and when to use the forms to convey meanings in specific contexts (Larsen-Freeman, 2001). Therefore, a lesson should start with students' understanding derived from a context instead of focusing merely on discrete grammar points (Larsen-Freeman, 2001). To explain further, Celce-Murcia (2007) points out that grammar instruction is much more effective when it is taught in a meaningful context, embedded in authentic or semi-authentic discourse, a state in which the teacher can help students reach the goal of learning by assigning them to do a suitable task.

Concerning context matters as noted earlier, theme-based instruction is one of a broader approach "content-based instructional model", which emphasizes language teaching through context. The lessons are usually developed around selected topics which are drawn from one content area (e.g. medicine) or from across the curriculum (e.g. global warming). Topics or themes play the role as a vehicle for language development (Brinton, Snow, & Wesche, 1989). When considering its benefits, it is believed that with theme-based instruction, the content of the lessons that is relevant and interesting to students will make them try harder to stay focused in their language study as well as have higher motivation (Brinton, Snow, & Wesche, 2003).

In regard to the role of grammatical knowledge that contributes to the development of writing ability, the present study explored the effects of grammar instruction using themes in the students' subject matters as the context to enhance their English writing ability.

Grammatical Knowledge

Traditionally, the term "grammar" is defined as a branch of the description of language that deals with the way words are combined to form sentences (Crystal, 1995). As regards language learning, Leech (1983) contends that grammar (formal system of language) and pragmatics (the

principles of language use) are complementary domains needed for studying because such domains have a connection with meaningful communication which is the nature of language. Grammatical knowledge is important for the comprehension of the conventions of Standard English (Haussamen, Benjamin, Kolln, & Wheeler, 2003). Meanwhile, pragmatic competence accounts for the ability to use words and utterances in context (Bachman, 1990). It enhances the students' ability in using socially appropriate language for the situations (Stalnaker, 1972).

As found in many previous studies, grammatical knowledge itself has been proven effective for writing instruction. Pazaver and Wang (2009) conducted a study with 16 immigrants ESL students who came to Canada from China, Iran, Lebanon, India, Syria, Israel, and Sri Lanka and found that these students credited grammatical knowledge as an instrument for communication, claiming that they saw a positive connection between grammatical knowledge and their improvement in writing ability (Pazaver & Wang, 2009). In other words, in order to be able to write appropriately, students needed to apply different grammatical rules to identify the mistakes in their writing assignments. They believed that this process facilitated their language communication. In another study which took place in public primary schools in Ibadan, Nigeria, Akinbote and Komolafe (2010) found that 290 students who received grammar instruction had a higher mean score in composition writing when they were compared to those who did not receive the treatment. They concluded that such an improvement was the result of teaching grammatical and linguistic features, like capitalization, comma, and punctuation.

The abovementioned studies show that grammar instruction can enhance writing ability of students and it can be more effective when grammatical features are taught embedded in meaningful contexts. At this stage, raising the importance of context, pragmatic competence should be mentioned since it deals with appropriate use of words and utterances in particular situations. To further explain, when grammar is taught through authentic texts, it can give additional comprehensible input for students and facilitate them in acquiring appropriate use of grammatical words, making students better able to see a connection of grammatical words than when grammatical points are taught discretely (Celce-Murcia, 2007; Krashen, 1985). Also, Nunan (1998) suggests that grammar instruction will be more useful in the classrooms when students are given opportunities to explore the functions of grammatical words in authentic texts.

To confirm the effects of grammar instruction with authentic texts, the present study employed theme-based grammar instruction with the themes derived from the students' interest as the content for the teaching of English grammar.

Theme-Based Instruction

Theme-based instruction (also named topic-based instruction) is a subcategory of content-based instruction (Brinton, Snow, & Wesche, 1989). Among the three teaching methods (theme-based instruction, sheltered instruction, and adjunct instruction), theme-based instruction puts a greater emphasis on developing language competence through the use of a specific topic area with a focus on language skills and functions, whereas the other two methods seem to deal with content mastery (Brinton, Snow, & Wesche, 1989). To clarify the differences of theme-based instruction from sheltered instruction and adjunct instruction, the following figure describes primary purposes, instructional format, student population, instructional responsibilities, and focus of education of these three content-based instructional models.

	Theme-Based Instruction	Sheltered Instruction	Adjunct Instruction
Primary Purpose	1) Develop students' competence of the target language, using specific topic area	1) Help students master content in their subject areas	1) Help student master content in their subject areas 2) Introduce academic discourse to students and develop transferable academic skills
Instructional Format	1) Language course	1) Require institutional framework	1) Require coordination between teachers of language and content course
Student Population	1) Non-native speakers	1) Non-native speakers	1) Language course: non-native speakers 2) Content course: native and non-native speakers
Instructional Responsibilities	1) Language teacher	1) Content area specialist	1) Language teacher 2) Content area specialist
Focus of Education	1) Language skills and functions	1) Content mastery	1) Content mastery

Figure 1: Comparison of Theme-Based Instruction with Sheltered Instruction and Adjunct Instruction

(Brinton, Snow, & Wesche, 1989)

Concerning its benefits to language learning, theme-based instruction gives students assistance in the learning of new vocabulary items by providing a meaningful context for understanding and promoting natural use of both written and spoken discourse types (Cameron, 2001). In terms of cost and time preparation, Masako (1996) in addition claims that theme-based instruction is easy to use in a language classroom when it is compared with the other two teaching methods because it allows language teachers to design curriculum, collect materials for teaching, and develop learning activities by their own. Most importantly, in-case-content specialists are available and language and content courses are well-cooperated, a theme-based course can be further developed to be an adjunct instructional course (Brinton, Snow, & Wesche, 1989). Besides, theme-based instruction can further develop the communicative competence of students in the linguistics, socio-cultural, and strategic domains of the target language (Masako, 1996). As a result, students will be more aware of using the target language as a means for learning. That is to say, the instruction encourages them to read, listen, speak, and write to learn instead of studying in order to read, listen, speak, and write. As for language teachers who prefer to use theme-based instruction, they need to keep a balance between content from a theme or topic and the language skills the students are required to master through classroom activities. They need to be certain that the language skills are practiced and the content in subject matter and activities are directed by the students (Mumford, 2000).

To develop theme-based lessons, Mumford (2000) suggests the teacher to plan learning lessons with students. The theme or topic can be introduced by the teacher or developed from the students' interests since students may have innovative ideas, resources, and strategies advantageous for the learning. Theme-based lessons derived from the students' interests can easily meet individual needs and increase their positive motivation in learning (Mumford, 2000). Apart from this, Berry and Mindes (1993) and Howe et al. (1991) advocate that the theme should be related to students' interests and topics taught in their disciplines. Such a correspondence will

make them try harder, staying focused in their study, with a higher level of motivation (Brinton, Snow, & Wesche, 2003).

Other than the aforementioned points of view, previous studies have confirmed that theme-based instruction can enhance students' language ability. For instance, Alptekin, Ercetin, and Bayyurt (2007) investigated the effectiveness of a theme-based syllabus and a grammatical syllabus in a Turkish primary school setting. They found that EFL students who studied under a theme-based syllabus developed better English listening, reading, and writing skills. Similarly, Yang (2009) examined the perceptions and impacts of theme-based instruction on levels of interest in an English course for primary ESL students in Hong Kong and reported that the students' perceptions of theme-based instruction were very positive. The students felt that activities and tasks were more integrated and well-organized, making their learning more meaningful and increasing their vocabulary knowledge. This was because such instruction promoted more interesting feelings than teaching English grammar discretely. The researcher suggested that for future research in concern with theme-based instruction, there should be a placement test administered to ascertain the current language level of the students before the course begins and a post-test to evaluate the effectiveness of the theme-based course. Moreover, the themes selected for teaching must be appropriate for the competency levels, wants, and needs of the students. They need to be relevant to their real-life communication as well.

Evidently, grammatical knowledge contributes to the enhancement of writing ability of students. The advantages of grammatical knowledge are not limited to only the ability to use Standard English but actually cover the ability to make comprehension in the meanings of sentences, the ability to identify writing mistakes, and the ability to create accurate sentences. With respect to theme-based instruction, not only does it provide meaningful context for understanding language usage, but it also promotes communicative competence of students in the linguistics, socio-cultural, and strategic domains of the target language. For these reasons, the present study aimed at exploring the effects of theme-based grammar instruction on the enhancement of English writing ability of Thai EFL students. To support the statistical results, the attitudes of the students toward the instruction were also investigated.

Research Questions

1. To what extent did theme-based grammar instruction improve English grammatical knowledge of Thai EFL students?
2. What were the effects of the grammatical knowledge together with theme-based instruction upon writing ability?

Methods

Participants

The participants of the study were 27 first-year undergraduate students at a public university in Nakhon Pathom Province, Thailand. All of them were sports science students. Nineteen students were male, and eight were female. Their ages were between 18 and 22 years. All of them studied English as a foreign language. They finished high school in Thailand and had been studying English for 12 years on average. Basically, the university offered four levels of English courses and the participants of this study were considered low-intermediate EFL students and placed in the English Level 1 course. This course mainly focused on the use of grammatical knowledge in

the context of daily life language, whereby the four language skills of speaking, listening, reading, and writing were integrated. The criteria for judging groups of students were determined by the university faculty that was in charge of English instruction. That is, the students who had the O-NET score (Ordinary National Education Testing)¹ in the English subject of less than 45 points needed to study the English Level 1 first. Meanwhile, the others who had higher scores could skip to the English Level 3 course. As for the group selection, sports science students were chosen as the participants of the study because a large majority of them usually had the lowest English language competence and experienced the most difficulty in writing when being compared with students from other faculties. Based on the data of the 2010 academic year, for example, it was found that from the total of 50 points, this group of students had the average mean score of 24.37 in the writing part which was less than the average mean score of 28.39 of the whole student population from other faculties.

Teaching Topics

A needs analysis was conducted with the participants of the study to find out the English grammatical features and structures as well as content matters which were used as the themes for teaching. It was found that word order seemed to be the most important grammatical structure, followed by parts of speech, verb tenses, articles and determiners, active and passive voices, types of sentences, fragments and run-on sentences, and subject-verb agreements. As for the content matters, the students were likely to have interest in the topics, such as indoor sports, fair play, nutrients, balls, jobs in sports management, four main streams in sports science, body testing, and stress of sportsmen during the competition. These content matters were extracted from authentic texts, such as magazines, newspapers, and Internet resources and then they were altered to be error recognitions.

The following table describes the themes used for each lesson:

Table 1: Themes and English Grammatical and Structures

Week	Themes	English Grammatical and Structures
1	Indoor Sports	Types of Sentences
2	Fair Play	Articles and Determiners
3	Nutrients	Subject and Verb Agreements
4	Balls	Parts of Speech
5	Jobs in Sports Management	Active and Passive Voices
6	Four Main Streams in Sports Science	Run-On Sentences and Fragments
7	Body Testing	Verb Tenses
8	Stress of Sportsmen during the Competition	Word Order

Concerning the instruction, the reasons for choosing error recognition were derived from the needs of students and their teachers. This is because past experiences of teachers who had taught the students showed that the students usually made errors when writing and cloze tests seemed to be difficult for them. The students themselves also preferred to do error recognition because this test type was mostly included in their mid-term and final examinations in their regular course. Thus, error recognition was used to transfer theme-based grammar instruction in the present study.

¹ The test that high school students are required to take before entering the university in Thailand.

Pre-Test and Post-Test

The topics for writing were “My Beloved Sport” for the pre-test and “How to Control My Weight” for the post-test. The students were assigned to write freely at least 80 words for each topic (Figure 2). The total score of the test was 100 marks with the time allotment of 30 minutes. The criteria for grading the students’ pieces of writing were adapted from the university requirement which included content (15 marks), punctuation (10 marks), paragraph organization (10 marks) and grammar rules and usage (15 marks) (See Appendix for Writing Rubric).

Pre-test	Post-test
<p>Topic: My Beloved Sport</p> <p><i>Use the following keywords to write a paragraph of at least 80 words. (You can add some more information if you want.)</i></p> <p>Keywords: your favorite sport, type of sport (indoor, outdoor, international, local), number of players, rules for playing, well-known players, etc.</p> <p>.....</p>	<p>Topic: How to Control my Weight</p> <p><i>Use the following keywords to write a paragraph of at least 80 words. (You can add some more information if you want.)</i></p> <p>Keywords: your height, weight, favorite food, number of meals you have, regular exercises, etc.</p> <p>.....</p>

Figure 2 – Sample of instruction sheets for the two writing assignments

Interview Protocol

The interview was employed to gain in-depth information about the attitudes of the students toward the effects of grammatical knowledge and theme-based grammar instruction on their English writing ability. In the present study, six students were interviewed on a voluntary basis. The interviewees were required to answer the questions, “Do you think grammatical knowledge has effects on your English writing ability and if yes, what are they?” and “Do you think theme-based grammar instruction has effects on your English writing ability and if yes, what are they?”. The interview process lasted 20 minutes. The Thai language was used in the interviews to allow students to overcome a language barrier.

Procedures

The data were collected from March to May in the year 2011. First of all, the pre-test was administered to the students in the first week of March. The purpose of the pre-test was to find out their background in English grammatical knowledge and writing ability before the treatment. During the experiment, the students were taught about 20 minutes after class every Tuesdays from 3.00 to 3.20 pm. An example of instruction is illustrated below:

Sample

At the beginning of the lesson, the teacher presented the students a passage with 15 words printed in bold. In this number, there were 10 errors. The students needed to identify the words, whether they were right or wrong. They also needed to correct the wrong ones.

*A ball is a **spherical** but sometimes oval object. Balls come in many **difference** shapes and even in the games that look **similarity** like beach volleyball and court volleyball, players still **requirement** different balls. Balls are made from **variety** materials, such as rubber, animal bladders, and skins. They are one of the most **common** used sports **equip** that sportsmen from various games need to **possess** from volleyballs to basketballs, baseballs to softballs, and soccer balls to footballs. In ball games, the ball is hit, kicked or thrown by **players**. Since the ball is usually used **heavy**, the quality of the ball is very **importance** in the game. When you are heading to buy a ball, it is necessary to **keep** in mind that a newer ball is better for you, especially in a **competitive**. This is because in a competitive game, even a few things can make the competitors take **advantageous** of the other and may result in great success for the competitor. All in all, you need to **remember** that you must buy a ball from a big store if you really want to get the latest version of the balls.*

- Teacher:** Have a look at this passage. [The teacher presents the passage on the board.] What is it about?
- Students:** Different types of balls.
- Teacher:** Good job! What do you know about balls?
- Students:** We use balls when we play sports, like basketball, baseball, volleyball, tennis, and so on.
- Teacher:** Let's see. Did you see any mistakes in the passages? [Students say "yes".] There are 10 errors out of 15 words. Can you tell me which ones are right and which ones are wrong? [Teacher reads aloud the first sentence] "A ball is a **spherical** but sometimes oval object." Look at the bold typed word "**spherical**". Do you think it is right or wrong?
- Student A:** I think it's wrong because the article "a" is placed in front of it. We have to put a noun after an article.
- Teacher:** That's partly correct, but if you look carefully, you will see that there is a noun after it, which is "object". So this word form "**spherical**" is right.
- Teacher:** OK. Look at the passage again. [Teacher reads aloud the second sentence]. "Balls come in many **difference** shapes and even in the games that look **similarity** like beach volleyball and court volleyball, players still **requirement** different balls." In this sentence, there are three bold typed words: "**difference**", "**similarity**", and "**requirement**". What do you think?
- Student A:** They are all wrong.
- Teacher:** Why? Can you tell me?
- Student A:** The plural noun "shapes" is placed after it. So we need to use the adjective form "different". As for the second one "similarity", it is also wrong because we need to use an adjective form after the verb "look".
- Teacher:** Right! The right one is the adjective form "similar". OK. What about the word "requirement".
- Student B:** I think it is wrong because the plural noun "players" plays the role as the subject of the sentence. So, we need to use the verb "require" in that place.

Teacher: Good job! [The teacher keeps asking students and explaining the word forms in the passage.]

After the teaching period, in the last week of May, the students then needed to take the post-test. The purpose of the test was to find out to what extent the students' English grammatical knowledge and writing ability were enhanced after receiving theme-based grammar instruction. To gain in-depth information about how theme-based grammar instruction had effects on their English writing ability, the interview was conducted.

Data Analysis

1. The scoring data from the pre-test and post-test were analyzed by paired-samples t-test. It compared the students' writing ability before and after receiving the treatment.
2. To ascertain the reliability of the scoring process of the tests, the tests were graded by two raters and then the scoring results were analyzed (inter-rater reliability co-efficient $\alpha = 0.93$ in the pre-test and $\alpha = 0.95$ in the post-test).
3. The interview data were transcribed and analyzed by content analysis. The data from the interview responses were used to support the results of the pre-test and post-test.

Results

Improvement of the Students' English Grammatical Knowledge

According to the results of the pre-test and post-test, it was found that the number of grammatical errors dramatically decreased from 122 errors to 56 errors.

Table 2: Types of Grammatical Errors Found in the Pre-Test

Types of Grammatical Errors	Frequency (Number of Word Errors)	Percent (%) Compared to Other Grammatical Errors	Types of Grammatical Errors	Frequency (Number of Word Errors)	Percent (%) Compared to Other Grammatical Errors
Nouns	20	16.4	Infinitives	1	0.8
Verbs	4	3.3	Gerunds	1	0.8
Modal Verbs	1	0.8	Conjunctions	2	1.6
Auxiliary Verbs	2	1.6	Relative Pronouns	1	0.8
Adverbs	3	2.5	Passive Voice	8	6.6
Adjectives	5	4.1	Active Voice	5	4.1
Prepositions	10	8.2	Subject-Verb Agreement	12	9.8
Articles	30	24.6	Present Perfect	1	0.8
Quantifiers	1	0.8	Present Simple	3	2.5
Pronouns	5	4.1	Past Simple	7	5.7
			Total	122	100

As shown in Table 2, the students made a lot of grammatical errors, such as nouns, verbs, articles, etc. However, after they had received theme-based grammar instruction, their errors dramatically decreased. Most importantly, as shown in Table 3, the errors in the use of prepositions, quantifiers, pronouns, infinitives, present perfect tense, present simple tense, and past simple tense were not found in the post-test. Such findings suggest that the students' English grammatical knowledge had improved.

Table 3: Types of Grammatical Errors Found in the Post-Test

Types of Grammatical Errors	Frequency (Number of Word Errors)	Percent (%) Compared to Other Grammatical Errors	Types of Grammatical Errors	Frequency (Number of Word Errors)	Percent (%) Compared to Other Grammatical Errors
Nouns	14	25	Conjunctions	1	1.8
Verbs	3	5.4	Gerund	3	5.4
Modal Verbs	1	1.8	Relative	1	1.8
			Pronouns		
Auxiliary Verbs	2	3.6	Passive Voice	6	10.7
Adverbs	1	1.8	Active Voice	2	3.6
Adjectives	1	1.8	Subject-Verb Agreement	3	5.4
Articles	18	32	Total	56	100

Apart from the improvement in English grammar uses, as a whole, the students also had improvement in their writing ability after receiving theme-based grammar instruction.

Enhancement of the Students' English Writing Ability

When comparing the gain scores from the pre-test to the post-test, it was found that the students' mean scores increased from 24.85 in the pre-test to 33.59 in the post-test. Also, the difference in the mean scores of English writing ability was statistically significant ($t = 3.091$, $p = .005$), as shown in Table 4 below.

Table 4: Comparison between the Pre-Test and Post-Test Writing Scores Using Paired Samples T Test

Test	N	Mean	SD	t	Sig. (2-tailed)
Pre-Test	27	24.85	13.91	3.091	.005
Post-Test	27	33.59	6.13		

In addition, when comparing the statistical results from Tables 5 and 6, they had considerably higher average mean scores in content, punctuation, paragraph organization and grammar rules

and usage in the post-test. This indicates that the students could write more skillfully and appropriately.

Table 5: Descriptive Statistics of the Students' Scores in Content, Punctuation, Paragraph Organization, and Grammar Rules and Usage of the Pre-Test

Writing Criteria	N	Range	Minimum	Maximum	Mean	Std. Deviation
Content	27	15	0	15	8.63	4.22
Punctuation	27	10	0	10	4.63	3.27
Paragraph Organization	27	10	0	10	5.15	3.70
Grammar Rules and Usage	27	14	0	14	6.44	3.77

Table 6: Descriptive Statistics of the Students' Scores in Content, Punctuation, Paragraph Organization, and Grammar Rules and Usage of the Post-Test

Writing Criteria	N	Range	Minimum	Maximum	Mean	Std. Deviation
Content	27	8	7	15	10.15	2.36
Punctuation	27	8	2	10	6.44	1.95
Paragraph Organization	27	6	4	10	7.19	1.71
Grammar Rules and Usage	27	10	5	15	9.81	2.17

Besides, not only did the students get the enhancement in their writing ability as proven by a significantly higher mean score in the post-test, it was also found that the number of lexical and other writing errors dramatically decreased from 93 errors in the pre-test to 52 errors in the post-test.

Table 7: Lexical and Other Writing Errors Found in the Pre-Test

Types of Errors	Frequency (Number of Word Errors)	Percent (%) Compared to Other Writing Errors
Word Order	5	5.4
Word Meaning	3	3.2
Incomplete Sentence	27	29
Spelling	35	37.6
Capitalization	14	15.1
Punctuation	9	9.7
Total	93	100

Table 8: Lexical and Other Writing Errors Found in the Post-Test

Types of Errors	Frequency (Number of Word Errors)	Percent (%) Compared to Other Writing Errors
Word Order	3	5.8
Word Meaning	1	1.9
Incomplete Sentence	7	13.5
Spelling	23	44.2
Capitalization	12	23.1
Punctuation	6	11.5
Total	52	100

As shown in Table 7, majority of the students made a lot of errors, such as word order, word meaning, incomplete sentence, spelling, capitalization, and punctuation. However, Table 8 reveals that after they had received theme-based grammar instruction, these errors dramatically decreased.

Furthermore, to shed light on the usefulness of theme-based grammar instruction, the following extracts of writing show how the same student who was taught this teaching method made better progress in her writing.

Pre-Test: My Beloved Sport

"I'm interest [part of speech] in basketball. In english [capitalization] called basketball too [incomplete sentence]. It's an international sport. I can play basketball at school. It's an outdoor sport. Basketball is a team sport. In a game we required [verb tense] 5 players. For playing it [comma] there are some rules we like [word meaning] to know it first [comma] such as the player can't tackle the other one, etc. I ever play [verb tense] it at school and I play it sometimes [word order]. I don't know any famous player [plural form] in this sport. It good for my health [incomplete sentence]. It make [subject-verb agreement] me stronger."

Post-Test: How to Control my Weight

"I consider myself overweight. I am 170 centimeters tall. I weigh 60 kilograms. I have a good weight loss idea which is to limit the amount of calories, but sometimes I find that it is so hard for me to manage. This is because I need to reduce the amount of my favorite junk food. I have three meals a day. It seem [subject-verb agreement] that I tend to have fats and carbohydrates more than other food groups. I like to eat pizza."

It can be seen from the above examples that this student made many errors in the pre-test, such as parts of speech, capitalization, incomplete sentences, verb tenses, punctuation, word order, word meanings, plural forms, and subject-verb agreement. However, in her post-test, she had only the wrong use of subject-verb agreement.

The statistical data as mentioned above show the enhancement of the students' English grammatical knowledge and writing ability. A statistically significant difference of the mean scores of the pre-test and the post-test was found. Grammatical, lexical, and other writing errors were reduced. The students could also apply English grammatical knowledge to write more skillfully and appropriately.

Attitudes of the Students toward the Effects of Grammatical Knowledge and Theme-Based Grammar Instruction on English Writing Ability

From the interview responses, it was found that the students had positive attitudes toward theme-based grammar instruction. In terms of grammar, all of them claimed that grammatical knowledge had great effects on their writing ability:

"Grammatical knowledge is very important. If we do not have good comprehension in English grammar, we may not be able to write meaningful sentences. We may not be able to express our thoughts as what we want. If we cannot write in the meaningful way, readers may misinterpret our thoughts. We are pretty sure to say that grammatical knowledge helps us write accurately and meaningfully."

Besides, three of them claimed that sufficient grammatical knowledge allowed them to identify and correct their writing mistakes easily:

"It is important because if we have grammatical knowledge, we can write correctly. We also know our writing mistakes and how to correct them easily."

With respect to theme-based grammar instruction, all of them claimed that such a teaching method provided them examples for writing:

"It is like the teacher gives us examples about how to write. Using a meaningful theme helps us learn English grammar better. We can use such examples as a clue to develop our own pieces of writing."

Four of them also claimed that they could see a connection of grammatical words easily through this teaching approach. This assisted them in choosing the right grammatical words:

"We learned how to use verb tenses better. We saw a connection of grammatical words from the passage. We knew that in that place, we had to use a past tense form while in the other place, we needed to use a past perfect form. We learned this from surrounding sentences. For example, if a former sentence had a past tense verb, we automatically knew that the latter sentence needed to use a past tense verb as well."

In addition, all of them claimed that teaching English grammatical features and structures using themes derived from their subject matters could help them improve English writing ability because they were what they were familiar with:

"I am pretty sure that using the themes I am familiar with as the context for study will help me write better. The themes are derived from what we specialize in. Therefore, we have sufficient background information. When English

grammatical features and structures are taught using such the themes, it is easy for us to understand and apply for uses in our pieces of writing”

To sum up, from the students’ attitudes, theme-based grammar instruction was worth being employed in writing class. Grammatical knowledge itself helped them write more accurately and meaningfully. When grammatical features and structures were taught using the themes they were familiar with, it was quite easy for them to attain comprehension. They hereby applied such a comprehension for uses in their writing work.

Discussion and Conclusion

The first research question addresses the enhancement of English grammatical knowledge of Thai EFL students after receiving theme-based grammar instruction. The findings showed a statistically significant reduction in the number of grammatical errors, thus indicating the effectiveness of the instruction to improve students’ English grammatical knowledge. Concerning the second research question, it was found that grammatical knowledge together with theme-based instruction could enhance the students’ writing ability as the mean score in the post-test was higher than that of the pre-test with statistical significance. That is to say, the students developed better well-organized and meaningful paragraphs in the post-test. There was a reduction in the number of errors of word order, word meaning, incomplete sentence, spelling, capitalization, and punctuation in the post-test. Besides, as presented in the interview results, it appears that the students had positive attitudes toward theme-based grammar instruction. Grammatical knowledge gave them assistance in identifying and correcting the errors. With good comprehension in English grammar, they could write meaningful sentences. They could show their thoughts as they desired.

Such findings as mentioned yield support to previous studies that confirm the advantages of grammatical knowledge. Bateman and Zidonis (1966) found that the students who received grammar instruction had a greater improvement in their writing ability than those without such instruction. Also, grammatical comprehension could reduce a number of errors in writing (Hulstijn & Hulstijn, 1984). Azar (2007) found that students who experienced grammar instruction had advantages over the students who lacked sufficient grammatical knowledge. The latter group with limited grammatical knowledge usually had difficulties in academic writing even though their speaking and listening were described as fluent (Azar, 2007). This is because these students did not know why certain verb forms were used, how a sentence was formed, and how sentences were related in a paragraph. However, though it seems that grammatical knowledge has advantages to writing, sentence-level drills cannot give sufficient contexts for students to learn when and how to correctly or appropriately use the grammatical features (Celce-Murcia, 2007). Moreover, in real-like situations, choices of appropriate use of grammar can only be conducted with references to the context and the purpose of the communication (Nunan, 1998). In this respect, the present study used a theme-based approach, teaching a language through content matters, to teach English grammar.

As a result of such a mix, it was found that theme-based grammar instruction had greater effects on writing ability of the students. The themes derived from their subject matters helped them write better because they were what they specialized in. They had sufficient background knowledge about the topics. For example, an interviewee said, *“We saw a connection of grammatical words from the passage. We knew that in that place, we used a past tense form while in the other place, we used a past perfect form...”* This response indicates that theme-based

instruction provides sufficient context for students to make comprehension about a connection of grammatical words and learn to use them appropriately. Likewise, previous studies have documented that theme-based instruction has significant effects on writing ability. Park (2005) believes that this teaching method is a key concept in student-directed learning which can develop the students' language competence, especially writing skills. Osman, Ahmad, and Jusoff (2009) found that the implementation of the theme-based model and cooperative process writing helped Malaysian students improve their motivation and writing ability, while Alptekin, Ercetin, and Bayyurt (2007) found that EFL students in Turkey who studied under a theme-based syllabus developed better English listening, reading, and writing skills. Besides, in terms of the attitudes toward instruction, Yang (2009) found that students' perceptions about theme-based instruction were positive because this teaching method helped them learn the target language with more interests than did discrete grammar instruction.

In summary, the findings of the present and previous studies as pointed out confirm the strength of grammar and theme-based instruction on the enhancement of English writing ability. That is to say, when they were mixed together like in the present study, not only did it enhance grammatical knowledge, but the approach also improved writing ability of the students.

Implications on Institutional Research and Education

Due to the advantages of theme-based grammar instruction as found out in the present study, such instruction should be promoted for future research and used in language classrooms.

Future Research

1. Other than developing writing skills, future researchers can use such instruction to examine the improvement in other productive skills, like speaking. Researchers can assign students to practice speaking after students receive theme-based grammar instruction.
2. Researchers can add a control group to compare the learning achievement between the group that receive theme-based grammar instruction and the group taught with traditional instruction.
3. Researchers can try the experiment with students from other language proficiency levels by upgrading the levels of text difficulty.

Language Classrooms

Language teachers who want to use theme-based grammar instruction in the classrooms can choose the texts derived from the students' preferences, appropriate for their levels, and not too complicated to comprehend. The teachers can use authentic texts extracted from media, such as newspapers, magazines, journals, or Internet resources to present grammar usage. This can help students learn writing from various forms. The teachers can highlight the uses of grammar in phrases and clauses and then explain a connection and roles of words in the passages. After that, the teachers can assign other different text types to students. Students can work in groups, discuss about grammar usage in the passages, and present a connection and functions of grammatical words in the passages to other student groups. After the discussion, the teachers can give writing

assignments to students to evaluate their comprehension in and the ability of using English grammatical features for writing

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Appendix

Scoring Rubric for Writing Tests (50 Marks)

Criteria	Maximum Score
<i>Punctuation: 10 marks</i>	
The spelling is correct.	3
Capital letters are used correctly.	3
There is a period after every sentence.	2
Commas or other punctuation marks are used correctly	2
<i>Content: 15 marks</i>	
The paragraph fits the assignment and is relevant to the topic.	6
The paragraph is interesting to read.	3
The paragraph shows coherence (paragraph unity and sentence cohesion).	6
<i>Paragraph Organization: 10 marks</i>	
The paragraph begins with a topic sentence that has both a topic and a controlling idea.	3
The paragraph ends with an appropriate concluding sentence.	3
The paragraph contains several supporting sentences.	4
<i>Grammar Rules and Usage: 15 marks</i>	
Check for sentence fragments and run-on sentences.	5
Check for various types of sentence (simple and compound sentences).	5
Check for overall grammar and sentence structure (subject-verb agreement, verb tenses, articles, and pronoun agreement).	5

* Adapted from the scoring rubric of the English Level 1 course, Faculty of Liberal Arts, Mahidol University

THE EFFECTS OF COMPUTER SIMULATIONS ON STUDENTS' CONCEPTUAL UNDERSTANDING OF ELECTRIC CIRCUITS

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Abstract

The purpose of this study was to examine the effects of computer simulations on understanding Direct Current (DC) circuits, and to understand how they enhance students' conceptual change of electrical circuits. It also identified what simulations features that facilitate understanding electrical circuits. Both of the quantitative and qualitative approaches were adopted in this study; the explanatory design in which the researcher collected the quantitative data before the qualitative data was followed. This research involved thirty participants who took Science I for Elementary Teachers course at the Hashemite University in Jordan in the spring semester of 2009/2010. The experimental group outperformed the control group on the test of understanding the concepts of DC circuits. After completing the quantitative part of this study, four students were interviewed to understand how computer simulations promoted their understanding of DC circuits. This study identified some key features of simulations that were very helpful to students in understanding DC circuits. The present study introduced several implications for teachers, administrators, and science education researchers.

Keywords: Conceptual Understanding, Electric Circuits, Simulations, Science Education

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Introduction

Computer technologies, especially computer simulations, are powerful tools in improving science teaching. Computer simulation can provide students with experiences that are more difficult and expensive to obtain in traditional situations (Guoqiang, 2002). They give students the opportunity to witness or perform experiments that might be too expensive, time consuming or too dangerous for them to do in the laboratories (Lejeune, 2002; Snir, Smith & Grosslight, 1995). In addition, they could be used to supplement to challenge and overcome students' alternative conceptions. Interactive Computer simulations which allow students to test hypotheses can be used for enhancing conceptual change (Zhou, 2002).

Computer simulations provide representations with different abstraction levels that may be close to the complex scientific concepts or phenomena. Gilbert and Ireton (2003) recommended providing students with experiences in the use of computer technology for presenting their constructed models to others, finding data and resources to use in their models, interaction with others to share and exchange data, collecting and processing real-time data in the laboratory and field using probes, modeling phenomena in inquiry format by manipulating set variables, constructing and testing open-ended models using pre-defined objects, and constructing models from real data on the internet (see Gilbert and Ireton, 2003, p.69). Computer modeling can make the scientific material more interesting (Valanides & Angeli, 2008).

The literature indicates that students have hard time understanding the scientific concepts such as the concepts of electricity (Duit, 2006). The researcher was interested in examining the effectiveness of computer simulations on understanding the concepts of Direct Current (DC) circuits. In order to improve the pedagogy of integrating simulations in teaching science, it may be necessary to provide science educators with description to the process of integrating simulations in teaching and learning science.

Computer Simulations as a Constructivist Tool

Computer simulations play an important role in promoting conceptual understanding of scientific concepts though the pedagogy of using computer simulations in learning science is relatively new. They help in creating discrepant event in hopes of producing cognitive conflict and curiosity (Monaghan & Clement, 1999). Monaghan and Clement believed that computer simulations can provide an experience that produces dissonance and then lead to schematic model that relies on mental simulation.

From a social constructivism perspective, cooperative learning may enhance understanding scientific concepts (Linn, 1998). Chou (1998) found that cooperative learning environment was successful. It offered students the opportunity to analyze the subject from more perspectives, and to be more emotionally involved. However, Guogiang (2002) recommended researchers to investigate whether computer-based

simulation favors individual learning or collaborative learning. The present study adopts the social constructivism as a framework for integrating simulation to promote conceptual change and understanding of DC circuits' concepts in a collaborative environment. In the present study, computer simulations were utilized to challenge students' alternative conceptions in a collaborative environment.

Constructing computer models by students develops students' thinking about dynamic processes (Boohan, 1997). Educators distinguish between modeling process and the use of computer simulations. When students use computer simulations, they are exploring a model which has already been created. Computer simulations as a true constructivist tool allow students to control their learning. Students can explore their questions and construct their own meaning and experiences (Chou, 1998). Several versions of the programmable modeling environment LOGO were developed and released (Wilensky, 1999). Logo was developed to make modeling accessible for most students but with "no ceiling" that it meets the needs of brilliant students. Fortunately, much user friendly software (e.g., Crocodile Clips) has been developed to make modeling accessible for most students in several subjects.

Modeling which refers to learning series of steps or procedures may enable students to construct their mental models. Greace and Moreira (2000) defined *mental models* as internal representations constructed by students that help them learn, explain, and predict phenomena. Treagust, Chittleborough and Mamiala (2002) found that students appreciated the visual value of scientific models in helping them generate or reconstruct their own mental models. In other words, modeling conceptual models, external representations, help students construct complete and coherent mental models.

Many researchers investigated the effectiveness of computer simulations in science education. Lejeune (2002) used Meta-analysis technique to synthesize the findings of forty studies on the effect of simulations on students in science education. The findings indicated significant positive effect for computer-simulated experiments on students' achievement in science. Lejeune found that computer simulated experiments contributed a significant positive effect on both low-level achievers (effect size = .34), and high-level achievers (mean effect size = .38) in science. Zhou (2002) found that computer simulations had significant effect in fostering students' conceptual change. These simulations were used in the exploration stage to address students' preconceptions. Baser (2006) examined the effect of computer simulations (QUCS) on pre-service teachers' understanding of electric circuits. The simulations were designed in a way to address students' alternative conceptions, in a constructivist use of simulations. Baser (2006) found that the use of simulations had positive effects on conceptual change. On the other hand, Tomshaw (2006) found the series of simulated experiments had no significant effect on students' conceptual understanding of physics concepts. Tomshaw pointed out that some problems with the implementation of the treatment might inhibit the effectiveness of the simulated experiments. Monaghan and Clement (1999) recommended

researchers to identify factors that may lead to improved pedagogical strategies for using simulations.

Alternative Conceptions of Direct Current Electricity

The literature showed that students hold many misconceptions about the basis of electricity even after formal instruction (Duit & Rhoneck, 1998; Duit & Treagust, 2003; Shipstone, 1984). Stocklmayer and Treagust (1996) emphasized the importance of addressing the problems experienced by students in electricity because, as to them, understanding of electricity is required in most countries. Some of these misconceptions are current consumption, battery as a constant current source, sequential reasoning, local reasoning, and superposition reasoning. Many researchers tried to explore these misconceptions and what internal representations students construct and use in explaining the basic concepts of electrical circuits (Borges & Gilbert, 1999; Shipstone, 1984).

Borges and Gilbert (1999) summarized the following models that had been explored by other researchers. Some of these models are:

1. Unipolar Model: There is a flow of current from the positive terminal of the battery to the bulb where it is all used up;
2. Two Component Model or Clashing Currents": "plus" and "minus" currents travel from the battery terminals to the bulb where they meet and produce energy; (3)
3. Closed Circuit Model: this model recognizes the bipolarity of circuit elements but it suggests that current is not conserved;
4. Current Consumption Model or „Sequence Model": In this model current is consumed as it goes through resistive circuit component, a fraction of current will return to the other end of the battery;
5. Constant Current Source Model: It encompasses bipolar circuit elements, the circulation of current in a cycle and the need for a closed circuit. But, it is constructed that the current supplied from the battery is always the same regardless of circuit features;
6. Ohm's Model or "scientific view": A current flow around circuit transmitting energy. Current is conserved and differentiated from energy. The circuit is seen as a whole system where a change in one point will affect the whole system.

Computer Simulations and Conceptual Framework

Computer simulation may play an important role in promoting conceptual change and understanding of scientific concepts. Conceptual change is one of the instructional

approaches within the framework of constructivism. Based on constructivism, two Piagetian terms have been continually related to conceptual change; these terms are assimilation and accommodation. While assimilation refers to the use of existing concepts (i.e., fitting new experience into existing schemata), accommodation refers to the successful reorganization of one's central concepts (Posner, Strike, Hewson & Gertzog, 1982). Glynn and Duit (1995) defined the constructive learning of science as a dynamic process of building, organizing, and elaborating knowledge of the natural world. In their view, students learn science meaningfully when (a) existing knowledge is activated and related to educational experiences, (b) intrinsic motivation is developed, and (c) new knowledge is applied, evaluated and revised. As to Treagust, Chittleborough and Mamiala (2002), learning science under the constructivist theory requires students to take the ownership of an idea or concept, reconstruct it, internalize it and be able to explain or communicate it to others.

Posner et al. had proposed a widely accepted theory of conceptual change in 1980s. They considered learning as a rational activity. This theory was relied on Piaget's work in developmental psychology of how learners learn through the assimilation and accommodation of knowledge that are guided by the principle of equilibration. They set four essential conditions for conceptual change. These common conditions are: a) students must be *dissatisfied* with the existing concepts; b) the new conception must be *intelligible*; c) the new conception must be *plausible* and; d) the new conception must be *fruitful* that students find it useful (Hewson, 1992). Computer simulations could be used to conflict students' misconceptions and get them dissatisfied with their non scientific prior knowledge. The multiple representations of simulations provide users with perceptual choices that make the system's relationships more intelligible and, as a result, the conception will be more plausible.

A range of teaching strategies have been designed and used to promote conceptual change (Lee & Law, 2001; Scot, Asoka & Driver, 1991). Although these teaching strategies had the same purpose of helping students toward a more scientific view, there are differences on how this purpose is reached. Computer simulations may play an important role in promoting conceptual change and understanding of scientific concepts. They could be utilized to challenge students' alternative conceptions, and offer students the opportunity to model circuits and test their hypotheses.

Computer simulations help in creating discrepant event in hopes of producing cognitive conflict and promoting conceptual change (Duit & Rhoneck, 1998; Monaghan & Clement, 1999). Learning science under the constructivist theory „requires students to take the ownership of an idea or concept, reconstruct it, internalize it and be able to explain or communicate it to others" (Treagust, Chittleborough & Mamiala, 2002). Students appreciate the visual value of scientific models in helping them generate or reconstruct their own mental models (Treagust et al., 2002).

Computer technologies can enhance the social interaction, and a group of learners can achieve more understanding than a learner could achieve alone (Linn, 1998). Moreover,

they facilitate addressing the features of scientific inquiry. Therefore, the present study was guided by using simulations in creating cognitive conflict in a collaborative learning environment. Also, the simulations were employed to address the features of inquiry instruction. The findings of this study may identify the key features of simulations that promote understanding DC circuits. This research may improve the pedagogy of integrating simulations in teaching science. The purpose of this study was to understand the effects of computer simulations on understanding the concepts of DC circuits. More specifically, this research aimed at answering the following research questions: (1) What is the effect of computer simulations on understanding the concepts of DC circuits; and (2) What are the key features of computer simulations and how they help students understand the concepts of DC circuits.

Methodology

Instrument

The author basically used DIRECT 1.0: Determining and Interpreting Resistive Electric Circuits Concepts Test (Engelhardt & Beichner, 2004) for collecting the quantitative data. DIRECT covered instructional objectives related to the physical aspects of DC electric circuits (e.g, short circuit, two-endedness, resistance, and interpreting circuits and diagrams), energy, current, and potential difference (voltage). DIRECT 1.0, a 29 multiple choice question, was developed to cover these objectives and rigorously validated, a sample of items are presented in Fig. 1

- 5) Compare the resistance of branch 1 with that of branch 2. A branch is a section of a circuit. Which has the least resistance?

(A) Branch 1

(B) Branch 2

(C) Neither, they are the same

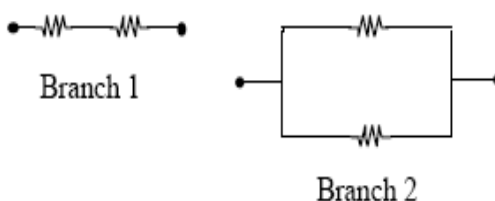


Figure 1. Sample items of DIRECT 1.0 (Engelhardt & Beichner, 2004)

Benefiting from my experience in teaching the topic of DC circuits in English and in Arabic at several schools, I translated the instrument into Arabic language but using the same circuits and diagrams. The original copy and the translated copy were presented to faculty members and science teachers to check the appropriateness of the translation, some terms were modified based on their comments and suggestions. Because energy and the microscopic aspects of current flow were not covered in the curriculum, the related questions were excluded and the translated instrument ended up with 21 questions. A pilot study was conducted to examine the reliability the test, the participants were 45

students. The reliability was estimated by Cronbach's alpha, and it was 0.74 which considered Slight modifications were made based on participants' feedback.

Participants

The participants were all enrolled in Classroom Teacher program. This program is designed prepare teachers to teach in the lower elementary grades in Jordan. Those pre-service teachers are prepared to teach all subjects but English for the first four grades (Grade 1 to 4). The program study plan involves three science courses. This study involved thirty female students who took Science I for Elementary Teachers course at the Hashemite University in Jordan in the spring semester of 2009 /2010. The participants were all female since the majority, if not all, of students whose major was Classroom Teacher were female.

Research Design

Both of the quantitative and qualitative approaches were adopted in this study. Johnson and Antony (2004) believe that the goal of using both approaches is to draw from the strengths of both approaches and minimize their weaknesses in a single research. This study used the explanatory design in which the researcher collects the quantitative data before the qualitative data (Creswell, 2002). The explanatory design enabled the author to elaborate on the quantitative results, and to obtain insight about how simulations affect understanding of DC circuits.

As for the quantitative part, a true experimental design was employed. The participants were randomly assigned to control group ($n_1 = 15$) and experimental group ($n_2 = 15$). Both groups were taught a unit of DC circuits differently. The experimental group was taught DC circuits with emphasis on using simulations in teaching while the control group was taught DC circuits traditionally, without using computer simulations.

The study implemented an interviewing design for the qualitative part of this study to understand how computer simulations affected students' understanding of DC Circuits.

Procedures of the quantitative part

The participants of the experimental group were taught the unit of DC circuits with emphasis on the use of computer Crocodile Clips simulations (<http://www.crocodile-clips.com>). Crocodile Clips is educational software which is available in several languages. By using Crocodile Clips, students were able to model a range of models in electricity and test their hypothesis (Crocodile Clips, 2010). In addition, students were able to control some variables such as the voltage or the number of bulbs in the series circuit to examine the effects of a parameter (e.g., voltage) on other parameters of the DC circuits, as shown in Figure 2.

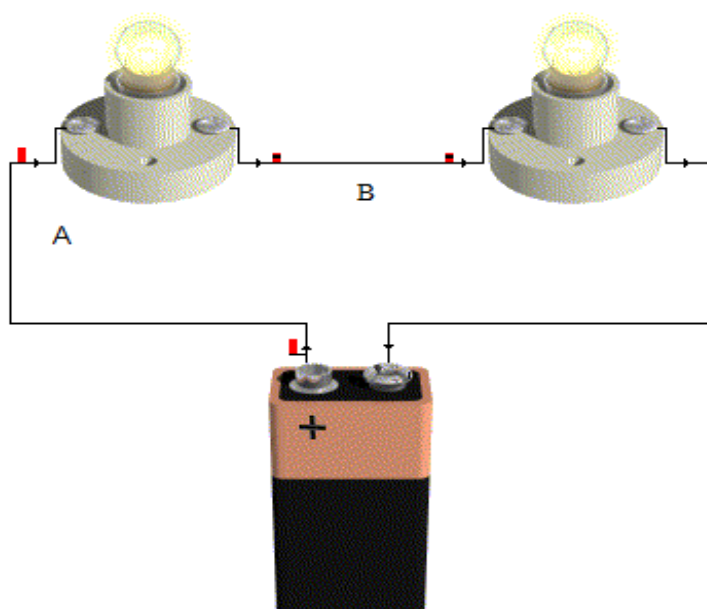


Figure 2: An Example of Modeling Simple DC circuit using Crocodile Clips

The participants were randomly assigned to two groups, experimental and control groups. The experiment lasted for three weeks. For each lesson, the participants of the experimental group were asked some questions to guide their software-based investigations, given the opportunity to set hypothesis, build a model by Crocodile Clips to test hypotheses, and asked to discuss and interpret their evidence-based conclusions. On the other hand, the participants in the control group were taught the unit of DC circuits traditionally (without computer simulations). The participants of both groups were given a post-test after studying a unit of DC circuit for around three weeks to compare the mean score of experimental group with the mean score of control group with regard to understanding of DC circuits. Because the participants were randomly assigned to two equivalent groups and to avoid the carry-over effect of testing, the participants were not given a pre-test.

Procedures for the qualitative part

The participants of the experimental group were asked if they would like to volunteer to participate in the follow up interviews. Four students from the experimental group were selected to be interviewed. The interviews lasted approximately from 15-20 minutes. The interview's protocol consisted of semi-structured open ended questions that cluster around understanding students' perceptions of the simulation experience in electrical circuits. Participants were asked questions like: (1) How did you benefit from computer simulations in understanding the concepts of DC circuits, and (2) What are the key features that were very helpful to you; how did they help you understand the concepts of DC circuits.

In this analytical procedure, the researcher coded the data based on common patterns and themes.

Results

Quantitative Results

An independent sample t-test was conducted to examine the difference between the mean scores of the control group and experimental group on the post-test. The results of Levene's test indicated that there was no statistically significant difference between variances of scores for the two groups ($F = 1.118$, $p = .30$).

The experimental group ($M_{\text{exp}} = 13.13$, $SD_{\text{exp}} = 4.61$) outperformed the control group ($M_{\text{control}} = 9.13$, $SD_{\text{control}} = 3.52$) on the test of understanding the concepts of DC circuits. The t-test confirmed a significant difference between the two means [$t(28) = -2.67$, $p = .012$].

Qualitative Results

After completing the quantitative part of this study, four students were interviewed in depth to understand how computer simulations promoted their understanding of DC circuits. Since the cross-case analysis allows for constant comparisons of participants' answers to the interview questions, I conducted cross-case analysis among participants and coded the data based on common patterns and themes.

In what follows, I present the findings of the cross-case analysis under two basic thematic categories: (1) the availability of electronic components and the ease of building circuits and testing hypotheses; and (2) the benefits of collaborative work while using computer simulations.

The availability of components and the ease of building circuit was an important factor that benefited students who built and used simulations. For example Amal¹ mentioned that "It was easy for everyone to build a circuit using the available components such as batteries, light bulbs and resistors". As for Rana, "the availability of components in different aspects was an important helpful feature of the simulation....in addition it was easy to build a circuit in very short time". The informants emphasized the importance of the available meters (voltmeters and ammeters), and how the ease of measuring the current and voltage helped them test their hypothesis and promote understanding of DC circuits as stated in the following excerpts:

²Sara: the most important feature helped understand that the current was the same in a series circuit was the availability of measuring instruments

Reema: the software offered an opportunity to test many cases (hypotheses) and understand the concepts

² All names are pseudonyms

Rana: the availability of the measuring instruments and the ease of using them was most important feature of Crocodile Clips.

The second theme was emphasizing the benefits of collaborative work while using the software in the science Laboratory as illustrated in the following accepts:

Sara: working in groups helped in discovering mistakes, everyone introduce an idea or information...but finally we reach the correct answer after discussing them.

Rema: the collaborative work was helpful, we benefited from each other by discussing the ideas everyone had before, and we worked together in testing

Amal: the collaborative work was helpful because it enabled students to cooperate and think together, and to benefit from the software together.

Rana: I prefer to work on simulations in groups provided that each student is given the opportunity use the software without dispute.

Discussion

The present study found that computer simulations could be effective in improving students' understanding of DC circuit's concepts. This finding was consistent with many related studies (e.g., Lejeune, 2002; Baser & Durmus, 2010). Computer simulations, as a constructivist tool, were very effective in creating discrepant events to produce cognitive conflict (Zhou, 2002) and curiosity in a collaborative learning environment. Computer simulations could be considered as an effective tool to promote inquiry-based instruction in science classrooms. The educational software used in this study enabled students to build models, test hypotheses, and form explanations from evidences. In other words, the software enabled them to implement the essential features of inquiry provided by the document *Inquiry and the National Science Education Standard* (NRC, 2000). Moreover the present study found that the cooperative environment was a successful one for integrating simulations in teaching science as suggested by Linn (1998).

This study identified some key features of simulations that were very helpful to students in understanding DC circuits. The availability of components (ammeters and voltmeters) and the ease of building circuit were important factors that benefited students who modeled and used Crocodile Clips simulations. Thus, the developers of educational software are recommended to develop user-friendly software which enables users to implement the essential features of inquiry instruction. As for the topic of DC circuits, the developers are advised to design the software in such a way that enables students to easily measure current and voltage at any point in an electric circuit.

The present study introduces several implications for teachers, administrators, and science education researchers. Science teachers are encouraged to integrate simulations in teaching the concepts of DC circuits. They are advised to utilize simulation in implementing the essential features of Inquiry introduced by NRC (2000). Also, science

teachers should plan and arrange to involve learners in a collaborative learning environment while using computer simulations.

Science education researchers are invited to investigate the effect of computer simulations on understanding other topics under the umbrella of the social constructivism. In order to improve the pedagogy of integrating simulations in teaching science, it is recommended that researchers introduce and test models for integrating simulations in teaching science. Also, they are invited to identify what key features of simulations that may improve students' understanding of other topics.

The small sample size of participants was a limitation of this exploratory study. Due to the small class sizes at the institution where the study was conducted, the researcher was not able to involve a larger sample size. Therefore, future studies that examine the effect of computer simulations on understanding electric circuits may involve larger sample sizes.

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DETERMINING THE LEVEL OF COGNITIVE KNOWLEDGE IN VOLLEYBALL FOR PHYSICAL EDUCATION STUDENTS AT YARMOUK UNIVERSITY

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Abstract

The primary purpose of this study was to determine the level of cognitive knowledge among physical education students enrolled in volleyball classes at Yarmouk University in Jordan. Another purpose of the study was to determine the impact of gender and academic year upon cognitive knowledge of students under study. The sample of the study composed of 175 students who responded to the researchers' designed questionnaire. The results of the study indicated weak to modest levels of cognitive knowledge among participants of the study. Results also indicated that gender and academic year of students did not have any statistical impacts upon the main construct investigated in the study. Finally, the study provided recommendations for the field of study.

Keywords: cognitive knowledge, volleyball, students, and Yarmouk University.

Introduction

The vast and tremendous advances in communication technology made it possible to have an access to academic/cognitive knowledge relevant to university level academic disciplines. Since the university is considered as the main provider of human knowledge, it is important to understand its responsibility toward students and the community at large. Through its interaction with students and the community, the university can strengthen students' skills and nurture the spirit of innovation (Mohammad, 2008).

It is well-articulated in the literature the virtue of science and knowledge and their progress in all areas of public life, including sports, which had a positive impact on the development of the educational process within the educational system. Today, higher education institutions take advantage of advanced technologies and modern educational methods to develop the skills and capacities of students. Further, cognitive knowledge in any academic discipline is at the center of academic knowledge to link theory with practice (Linder, 2002). Thus, higher education institutions must come up with a solid curriculum that covers the cognitive aspects of the academic specialization.

One aspect of improving cognitive achievement of students is using various technology systems (Salovara, 2005), focusing on students' goals, beliefs, abilities, and incentives (Lawson, 2005), and factors such as happiness, physical health, cognitive development and language (Nadin, Pascal, Michal, Ginette, Jean, Fronk & Richard, 2007). It is speculated by previous research that other factors related to physical fitness is also related to cognitive achievement. For example, Grissom (2005) indicated that there is a strong positive relationship between fitness and cognitive knowledge. Chen and Shin (2004) emphasized that physical activities practiced by students outside school have the greatest impact on students' cognitive learning. Shatarat and Hussain (2007) stressed the fact that students should first develop cognitive learning then such learning may lead to exemplary practice in any physical sport. Scheuer and Mitchell (2003) indicated that student's who received additional physical activities witnessed improvements in cognition and academic achievement more than students who did not practice these extra-activities. Other studies provided major findings related to the fact that physical activity may lead to improve brain work, energy level, self-esteem and behavior (Scheuer & Mitchell, 2003; Dwyer, Sallies, Blizzard, Lazarus & Dean, 2001; Linder, 1999; Linder, 2002; Shephard, 1997). Finally, previous research indicated that factors important to determining the cognitive knowledge in volleyball may include factors such as fitness, law, basic skills, tactics, team leadership, history and sports injuries (Grissom, 2005; Mohammad, 2008; Scheuer & Mitchell, 2003).

Statement of the Problem

The importance of cognitive achievement to many sports especially the volleyball game has emerged as an important subject represented by the need to provide modern methods to measure students' cognitive knowledge. To the researchers' best knowledge, empirical

evidence is rather limited with regard to determining the level of level of cognitive knowledge among physical education students enrolled in volleyball classes at Yarmouk University in Jordan. Another primary purpose for the study was to test for the effect of gender and academic year of the study sample upon cognitive knowledge of volleyball.

Research Questions

This study aimed to answer the following research questions:

1. What is the level of cognitive knowledge among physical education students enrolled in volleyball classes at Yarmouk University in Jordan?
2. What is the impact of gender and academic year upon cognitive knowledge in volleyball?

Methodology

Population and Sample

The target population for this study comprised of 250 students from the Faculty of Physical Education at Yarmouk University in Jordan who are registered for the volleyball course (2) and advance volleyball courses during the summer semester of the academic years 2007/2008. The sample of this study consisted of 175 students chosen randomly from the population of the study. The sample distribution was 77 (44%) males and 98 (56%) females. There were 74 (42.29%) second year students, 71 (40.57%) third year students, and 30 (17.14%) fourth year students.

Instrumentation

The cognitive knowledge test used in the study was developed by the researchers after a comprehensive review of previous theory and research related to the subject under investigation. The instrument consisted of 60 items distributed over the following domains: fitness, law, basic skills, tactics, team leadership, history and sports injuries in volleyball. Table 1 shows these domains in more specifications. According to the table, questions were suggested to cover all proposed areas; 60 multi-choice questions were proposed and presented to experts to study their suitability in terms of words and proximity and measurement of the domain. After that, depending on expert's opinion, some questions were changed and modified and written off and exchanged with others.

Table (1)
Specifications table of areas and number of suggested questions

Domains	Number of proposed questions			Total
	Knowledge	Comprehension	Application	
Fitness	2	2	5	9

Domains	Number of proposed questions			Total
	Knowledge	Comprehension	Application	
Law	4	4	7	15
Basic skills	3	3	6	12
Tactics	3	3	6	12
Team leadership	1	1	4	6
History	1	1	1	3
Sport injuries	1	1	1	3
Total	15	15	30	60

Validity of the Instrument

The content validity of the instrument was established through expert opinions who assured the suitability of questions and their relation to respective domains of cognitive knowledge. Further, logical validity was extracted through the square root of the reliability coefficient. Table 2 shows the results of the logical validity.

Table (2)
Validity and Reliability coefficients of the domains and whole scale

Domains	Coefficient of validity	Level of significance	Reliability of the correlation coefficient
Fitness	0.797	0.011	*0.635
Law	0.892	0.001	**0.795
Team leadership	0.759	0.024	**0.577
Tactics	0.727	0.043	*0.528
Sport injuries	0.732	0.040	*0.536
History	0.851	0.002	**0.724
Basic skills	0.725	0.044	*0.526
Total	0.902	0.001	**0.814

* Significant at level 0.05

** Significant at level 0.01

Coefficients of discriminated and difficulty indexes of the test

After the extraction of the validity and reliability of the instrument, the test was applied for the main sample. Before extraction the main results, the coefficients of discrimination and difficulty were confirmed. Of the 60 questions, 48 questions were extracted, and 12 questions were deleted because didn't have appropriate statically acceptable ratios of discrimination and difficulty coefficients. The questions that have difficulty coefficients between (0.30-0.70) and discrimination coefficients above (0.30) were accepted (see Table 3).

Table (3)
The discrimination and difficulty coefficients index of cognitive knowledge test

Question number	Discrimination coefficients	Difficulty coefficients	Question number	Discrimination coefficients	Difficulty coefficients
1	0.41	0.50	31	0.22	0.47
2	0.23	0.48	32	0.55	0.43
3	0.35	0.55	33	0.54	0.57
4	0.25	0.45	34	0.57	0.47
5	0.33	0.47	35	0.34	0.62
6	0.36	0.45	36	0.56	0.50
7	0.37	0.25	37	0.52	0.65
8	0.40	0.45	38	0.59	0.60
9	0.46	0.60	39	0.50	0.48
10	0.31	0.50	40	0.65	0.55
11	0.61	0.50	41	0.33	0.50
12	0.55	0.67	42	0.50	0.60
13	0.44	0.52	43	0.37	0.50
14	0.33	0.55	44	0.50	0.50
15	0.34	0.68	45	0.30	0.40
16	0.31	0.40	46	0.33	0.50
17	0.23	0.45	47	0.48	0.48
18	0.28	0.45	48	0.33	0.60
19	0.31	0.48	49	0.54	0.50
20	0.37	0.30	50	0.22	0.52
21	0.36	0.43	51	0.41	0.75
22	0.38	0.37	52	0.65	0.57
23	0.42	0.58	53	0.47	0.48
24	0.47	0.53	54	0.49	0.53
25	0.45	0.58	55	0.23	0.55
26	0.47	0.53	56	0.41	0.60
27	0.45	0.52	57	0.23	0.52
28	0.35	0.38	58	0.44	0.55
29	0.28	0.57	59	0.23	0.52
30	0.56	0.37	60	0.25	0.45

Data Analysis

To answer the first research question which is to determine the level of cognitive knowledge among physical education students enrolled in volleyball classes at Yarmouk University in Jordan, means, standard deviations and percentiles were used. To answer the second research question which is to test for the effect of gender and academic year

upon cognitive knowledge in volleyball, analysis of multivariate test (MANOVA) was used.

Results

The data collected from all participants were coded, entered into SPSS spreadsheets, and analyzed using SPSS version 17. Descriptive statistics for all variables were examined using SPSS frequencies. The minimum and maximum values for each variable were examined for accuracy of data entry by checking for out of range values. No out of range values or missing subjects were detected.

Results Pertain to the first research question

The first research question of this study was to determine the level of cognitive knowledge among physical education students enrolled in volleyball classes at Yarmouk University in Jordan. As shown in Table (4), the mean of cognitive knowledge total score was (0.473) while the percentage reached was (47.33%), which reflect scores average below the mean. Mean scores on the domains of cognitive test were as follow: laws of the game (0.483), team leadership (0.475) tactics (0.455), sport injuries (0.447), history of the game (0.430) and skills of the game (0.428). These mean scores indicate low score below average mean. However, mean score of fitness aspect of the game was above average with a mean score of (0.574) with a percentage of (57.4%). According to these results, it is appeared that a week level of cognitive knowledge exists for students in the volleyball game.

Table (4)
Means, standard deviations, and percentiles for the domains of the instrument

Domains	frequency	Mean	Standard deviation	Percentile	Number of items
Fitness	175	.574	0.27	%57.43	9
Law	175	.483	0.25	%48.30	15
Team leadership	175	.475	0.27	%47.50	6
Tactics	175	.455	0.23	%45.54	12
Sport injuries	175	.447	0.37	%44.76	3
History	175	.430	0.35	%43.00	3
Basic skills	175	.428	0.24	%42.86	12
Total	175	.473	0.11	%47.33	60

The second research question for this study was to determine the impact of gender and academic year upon cognitive knowledge domains in volleyball. As shown in Tables 5, 6, 7, there were significant differences appeared for the fitness, basic skills, and law domains of cognitive knowledge test in volleyball with respect to gender variable. This indicates significant differences between male and female students on these domains for the favor of males in fitness and basic skills domains while for the favor of females in the

law domain, which refer that the fitness and basic skills cognitive knowledge for males is more than females whereas law cognitive knowledge for female is more than that of males. Also, as shown in the table, there were no significant differences between males and females on the total average score of the test and on the other domains.

Also, for academic year variable the table indicates that there were significant differences appeared for just the sport injures domain of cognitive knowledge test in volleyball. The table also showed that there were no significant differences between second, third, fourth year in cognitive knowledge in the total average of test and in the other domains. And to determine the preferences of difference for each year in sport injures domain the Multiple Comparisons (Scheffe) test was used. The table indicates that the main differences appeared between just second and third year group ($p=0.010$) and for the favor of the third year which have the higher mean (0.575).

Table (5)
Mean and standard error for gender and academic year variables

Domain	Descriptive statistics	Gender		Academic year		
		Male	Female	Second	Third	fourth
Total	Mean	.462	.482	.461	.484	.472
	Standard Error	.014	.012	.014	.014	.021
Fitness	Mean	.632	.529	.542	.622	.576
	Standard Error	.034	.029	.032	.034	.050
Tactics	Mean	.479	.448	.491	.408	.492
	Standard Error	.028	.024	.027	.028	.041
Team leadership	Mean	.470	.034	.433	.512	.485
	Standard Error	.484	.029	.032	.034	.050
Basic skills	Mean	.492	.367	.373	.455	.460
	Standard Error	.025	.029	.027	.029	.042
History	Mean	.471	.399	.373	.455	.460
	Standard Error	.044	.038	.027	.029	.042
Sport injures	Mean	.502	.399	.348	.575	.428
	Standard Error	.046	.039	.043	.045	.067
Law	Mean	.423	.511	.520	.457	.423
	Standard Error	.032	.027	.030	.031	.046

Table (6)
Analysis of Multivariate test (MANOVA) for the impact of the gender and academic year on cognitive knowledge domains

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.
gender	Total	.015	1	.015	1.125	.290
	Fitness	.389	1	.389	5.408	.021

	Tactics	.035	1	.035	.704	.403
	Team leadership	.007	1	.007	.098	.754
	Basic skills	.571	1	.571	10.806	.001
	History	.189	1	.189	1.542	.216
	Sport injuries	.392	1	.392	3.009	.085
	Law	.284	1	.284	4.583	.034
academic	Total	.016	2	.008	.615	.542
	Fitness	.200	2	.100	1.392	.251
	Tactics	.267	2	.133	2.686	.071
	Team leadership	.198	2	.099	1.338	.265
	Basic skills	.257	2	.128	2.433	.091
	History	.069	2	.035	.282	.754
	Sport injuries	1.639	2	.820	6.295	.002
	Law	.220	2	.110	1.771	.173

Table (7)
Multiple Comparisons (Scheffe) test for the impact academic year of sport injures domain

Dependent Variable	(I) academic	(J) academic	Mean Difference (I-J)	Std. Error	Sig.
Sport injures domain	second	Third	-.1844*	.05994	.010
		Fourth	-.0462-	.07810	.839
	third	Second	.1844*	.05994	.010
		Fourth	.1382	.07857	.216
	fourth	Second	.0462	.07810	.839
		Third	-.1382-	.07857	.216

Discussion

The primary purpose of this study was to determine the level of cognitive knowledge for volleyball among physical education students at Yarmouk University in Jordan. The results indicated a weak level of cognitive knowledge among volleyball students. This result is justified by the fact that students under study place more emphasis on physical fitness as well as the skill aspects of the game which are more related to performance in the playing field than other aspects of the game. The fitness aspect of the game emerged

as the most prominent in this study because it is introduced continuously in volleyball curriculum at colleges especially in the applied part of the curriculum.

A perplexing result was the low scores that emerged on the skills aspect of the game. Lack of student's interest and insufficient emphasis by instructors on this aspect might be another explanation. These results are consistent with other studies such as Rahahlah and Shoghah (2007); Hatamleh (2000); and Fartusy study (2004) which revealed a very low level of cognitive knowledge among students that revealed poor cognitive knowledge scores among students in various games.

The results also indicated variations in fitness between male and female students as well as basic skills for the favor of males, where as for the favor of females in the law domains of cognitive knowledge. These results can be attributed to the weakness of cognitive knowledge for both male and female students in volleyball. With regards to the superiority of male students in fitness and basic skills domains, it could be attributed to the fitness abilities of males, which is always better than females. The female preference for the law domain can be attributed to the interest of female students in the theoretical knowledge of the game more than the practical knowledge. These results are consistent with the study of Grissiom (2005) who found that cognitive knowledge for females is higher than males.

The study provides the following recommendations based on the results of the study:

- (a) the cognitive knowledge tests should be utilized in evaluating students of volleyball courses in Yarmouk University (after verification of research and statistical measures employed in this test relative to the validity of the test items);
- (b) coaches and referees of volleyball must be subjected to standardized cognitive knowledge tests; and
- (c) construct cognitive knowledge tests in volleyball in other Jordanian university and compare results in Jordanian academic institution.

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