

WIKI & TGFU:  
A COLLABORATIVE APPROACH TO UNDERSTANDING GAMES EDUCATION

by

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## ABSTRACT

Technology is becoming an integral part of teaching and learning in schools. In recognition of the potential contributions of technology toward learning, this thesis explored the use of a wiki, a collaborative webpage where students are free to add, edit, erase or create content (Leuf & Cunningham, 2001), within physical education teacher education. Using interpretive inquiry (Ellis, 1998) as a methodological framework, this qualitative study investigated the perceptions of a cohort of 28 final year physical education teacher candidates regarding the usefulness of wikis as an instructional tool to enhance learning through an online five-week collaborative group project. The objective of the assignment was for teacher candidates to develop deeper understanding of the Teaching Games for Understanding (TGfU) approach, which creates student-centred games education that links tactics and skills in game settings. The study employed several qualitative research activities including: observing the daily entries on the wiki, document analyses of reflective journals, pre- and post writing samples, and focus group interviews. The information collected identified both enabling and constraining factors this wiki brought to a collaborative undergraduate online project. Data analyses confirmed that the wiki facilitated collaboration among group members, improved writing skills and enhanced deeper understanding through scaffolding of one's own ideas as well as those of others. Findings also showed how the teacher candidates interacted with the content to gain a deeper understanding of the TGfU approach through an emergent design of scaffolds. In their efforts to work collaboratively, the students realized that establishing roles and responsibilities and creating more opportunity for communication were

necessary ingredients for learning. To encourage knowledge acquisition, the instructional guidance provided by the teacher was a crucial component of the scaffolding design. In sum, this thesis elaborates on how wikis contributed to the development of an understanding of teaching games.

## ACKNOWLEDGEMENTS

I often wondered whether a thesis would be of better quality if it was written in collaboration with another student. However, even though only one author is listed on the title page, no thesis is ever the work of only one person and this thesis is no exception. When completing this thesis, I realize that this piece of writing is an accumulation of the efforts of a group of individuals, not just one writer. During this process, several people took the time to assist me in ways I am truly grateful for. A few key people I would like to highlight below, each accompanied by a descriptive word to express the impact they had on me throughout my Masters program.

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## CHAPTER ONE

### Introduction

Enhancing teacher candidates' understanding of the complexities associated with the design and implementation of quality physical education instruction is the primary focus of physical education teacher education (PETE) programs. Quality programming includes teaching fundamental movement skills, active games and life skills to promote an active healthy lifestyle (Manitoba Education, 2000). This study focused on the preparation of physical education (PE) teacher candidates in the area of games education<sup>1</sup>. Although several instructional models exist to effectively teach games, this study concentrated on the "Teaching Games for Understanding" (TGfU, Thorpe, Bunker, & Almond, 1986) approach. The TGfU approach facilitates an understanding of game theory through the development of tactical awareness and skill development during the playing of modified games (Hopper & Kruisselbrink, 2002). Additionally, the approach encourages students to construct meaning from situations that incorporate any of the four game categories: invasion/territory, net/wall, target and striking/fielding (Butler & McCahan, 2005; Thorpe et al., 1986).

Research suggests that the teachers' understanding of the "TGfU" approach is an important element in their commitment to using the approach and their experiences in teaching games (Light, 2003). Howarth (2005) indicates that teacher educators remarked

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<sup>1</sup> For the purpose of this study, the term "teacher candidates" or "participants" will be used to refer to the undergraduate students involved in this research study. The term "students" will be applied to discuss any matter related to the teaching of students in general. Additionally, the term "teacher educators" refers to professors who teach in teacher preparation programs.

that insufficient time spent teaching the content of games during class subsequently contributes to a poor understanding of effective game teaching practices. The necessity to locate an instructional tool that may enhance teacher candidates' understanding of teaching games inspired this research.

As a former public school PE teacher and university sessional instructor, I draw upon constructivist principles when selecting effective instructional tools and developing activities within my own teaching. I believe that students create meaning by being actively involved in their own learning. According to constructivists, forming meaning is the aspiration of learning and it requires reflection and articulation of what we know (Jonassen, Davidson, Collins, Campbell, & Haag, 1995). Learning should be interactive and based upon students' prior knowledge, interests, and abilities. From a constructivist point of view, we can proclaim that when teacher candidates express, reflect, and collaborate on what they know, their learning experiences will lead to richer understandings and applications of their own teaching. Planning effective activities where students can connect and integrate experiences from other contexts or with other students will further develop their understanding of the content. A learning environment should be a place where students can create meaning, reflect, and apply knowledge by challenging their own understanding and learning new knowledge.

#### *Concerned engagement*

In the process of reflecting upon my own teaching philosophy and experiences, I often wonder whether what I am doing is helpful to the students. I have asked myself, how do my teaching strategies enhance learning? Ellis (1998) refers to this process as

“interpretive inquiry”, a process of interpreting or “reading” a situation to explore, question, and create understanding before acting or responding. An interpretive inquiry approach is a qualitative research method that examines a question related to the concerned engagement of the teacher. The questions I pose are: *“How can I, as a teacher and researcher use my own teaching philosophy as a way to support the needs of teacher educators when teaching the TGfU approach? Can I provide students with a learning environment where they can express, reflect, and collaborate on the model of TGfU to enrich their understanding of teaching games? Additionally, will the instructional tool complement the in-class instruction?”*

One way teachers create additional tasks to practice or gain a deeper understanding of the concepts learned in class is through homework or projects, completed individually, or in groups. Reflecting on my own teaching philosophy, I suggest that many students gain deeper understanding of new concepts through collaboration rather than by working alone. Therefore, I have explored the use of group work within this inquiry. When choosing an instructional tool, I considered both the research and the concerns of the students. First, the research around TGfU, as stated above, refers to the lack of time teacher educators have to present the knowledge content of teaching games to teacher candidates. One solution could be to create a project that teacher candidates complete outside of the classroom, which will extend the in-class instructional time. Second, from my own experience, both as a teacher and a student, project work often corresponds with high levels of anxiety and frustration among teacher candidates. Several issues come to mind as I will illustrate in the following narrative.

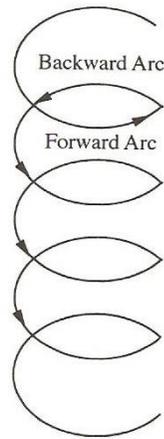
*Yet another group project*

*I'm sitting in an undergraduate class, and as the professor passes along the new assignments, I immediately notice several reactions from my peers. The realities and challenges of a group project immediately reveal the expressions of concern found on many of the students' faces. It may be a very interesting project but that is not the point. Almost immediately after the announcement of the project, tension increases, hands rise and questions reflecting frustrations emerge. "Will we have adequate time to work on this project in class?" Most likely the response to this question will be "no" as students will be expected to work on their own time at home. Primarily, the reason given for not providing in-class time to work on projects is the limited instructional time professors have to cover all the course objectives. Additional reasons to do a project out of class are to extend the learning experience to create deeper understanding of the content and to develop teamwork and communication skills among students.*

*A question students ask themselves often is "How will the group be able to assemble outside of class time?" Students must coordinate schedules and often have multiple projects on the go at once which creates additional stress especially for those students lacking time management skills or those who must uphold two jobs to stay financially secure while in school. They might ask themselves: "Will I end up doing the project on my own? Will I end up with a lower mark because my group was unable to meet frequently to complete the task? What will I learn from this experience?"*

This narrative anecdote reflects that, for some students, group work can be frustrating, stressful, and often not worth the time and effort required. In fact, in a recent teaching experience in an undergraduate course, the students participated in a group project and their reflections consistently revealed that although they enjoyed the project, they experienced difficulties meeting face-to-face with group members. It seemed difficult for them to assemble at a time convenient to all. To alleviate this issue, one group used 'Facebook', an online social network, to communicate and collaborate with group members. Another interesting aspect related to this particular group was that although the professor wanted to use the group work as an effort to encourage collaboration, some groups ended up splitting the workload, which limited the possible benefits of collaboration. As I reflect upon my own experiences as a teacher, I now realize that the efficacy of group work is worth questioning. It requires deeper investigation and in light of my interest in TGfU as it relates to teacher education, there is potential to explore the links between group work, technology and TGfU through formal inquiry.

Ellis (1998) asserts that when we wish to get closer to what we need to understand, the study can be viewed as "a series of loops in a spiral (Fig.1), each loop in the spiral representing a separate inquiry activity within the study, and each loop starts through uncovering the previous loop" (p.20). Teachers who reflect upon their own practice tend to use this spiral as well by attempting to understand students' needs and selecting activities or instructional tools to meet those needs.



*Figure 1.* Interpretive Inquiry as an Unfolding Spiral (Ellis, 1998, p. 20)

One instructional tool often overlooked by teachers, yet given plenty of attention within educational research, is the use of technology. Teachers can use computer programs as instructional tools within the classroom as well as outside of the classroom. A “wiki” is such a tool. A wiki is a webpage and collaborative instrument where students can freely add, edit, erase and create knowledge (Leuf & Cunningham, 2001). In short, a wiki is an editable webpage. A wiki forms an online meeting place where students can form a community of learners, each responsible for creating knowledge, yet building on their peers’ understanding to create a broader awareness of the content (Engstrom & Jewett, 2005). Wikis are accessible to all people with computers and a web browser. Wikis encourage communication, promote the use of literacy and technology skills and may contribute to the creation of positive relationships between students (Schwartz, Clark, Cossarin, & Rudolph, 2004).

When reflecting upon the frustrations of group work and the lack of collaboration within these groups, I wonder how wikis might provide a supportive collaborative online

environment, eliminate students' frustrations, and enhance learning. This question created another loop in my interpretive inquiry. In an interpretive inquiry, research begins with such a question and continues with several data collection and analyses stages where new meaning will guide the path of further research (Ellis, 1998). It is important to this type of study that the inquirer is vigilant about how he or she interprets each step in the process as new data and interpretation may evolve and influence the path of the investigation. In response to my own concerned engagement, and to uncover answers to the questions posed, this study investigated the experiences of a cohort of final year physical education teacher candidates using a wiki to provide new insight and meaning with regard to games education. As a means to initiate this interpretive inquiry, I collaborated with a professor who teaches a course for senior year PE teacher candidates, which began in September 2007 and ran until April 2008. The purpose of this course was to support teacher candidates in developing pedagogical skills in the area of physical education through a variety of interactive activities in which the wiki project is one.

#### Purpose

For the purpose of this study, I investigated the use of wikis in the field of Physical Education Teacher Education (PETE). This study examined the perceived influence of wikis on learning as seen through the experiences of PE teacher candidates participating in a project on teaching games for understanding. I posed the question, how can wikis enrich the teacher candidates' understanding of teaching games as promoted by the TGfU approach? Further, how did students use wikis to collaborate and build on each other's ideas? Based on the experiences of the students, I wanted to know how wikis

influenced the in-class learning experience through an online interactive learning environment.

#### Rationale for research

Over the last few years, the province of Manitoba has experienced many changes in the area of physical education (PE). Curriculum changes include a combined PE and health curriculum (Manitoba Education, 2000), mandated PE in grades K-10 (Manitoba Education, 2004), and a newly introduced mandated curriculum for grades 11 and 12 (2006) to be implemented in 2008 . In addition to curriculum changes, societal views have evolved to create extra challenges for PE teachers. There is greater emphasis on enhancing health and lifelong fitness (Hill & Brodin, 2004) while adopting an all inclusive environment (Manitoba Education, 2000). With regards to this study, I suggest that the “Teaching Games for Understanding” approach (Bunker & Thorpe, 1982) may, in fact, complement the new curriculum outcomes. When students’ game performance improves, their level of enjoyment and participation improves as well (Werner, Thorpe, & Bunker, 1996). Furthermore, through the use of modified lead-up games, students gain more success earlier in the game which may create a more inclusive environment sensitive to students of all needs and skill levels (Butler & McCahan, 2005).

Since 1989, several researchers have demonstrated the positive implications of using the TGfU approach when teaching games (Bunker & Thorpe, 1982; Butler & McCahan, 2005; Chandler, 1996; Hopper & Kruisselbrink, 2002). In teacher education, it is often stated that teacher educators must foster the teacher candidates’ pedagogical content knowledge in order to enhance their understanding of the process of learning and

teaching (Shulman, 1986). Teachers must first gain a deep comprehension of the tactics and skills of all four games categories (Chandler, 1996; Thorpe et al., 1986) and second, teachers must be able to select game forms which are developmentally appropriate (Chandler, 1996). Another common inquiry related to teaching teacher candidates the tactical games approach is to ask appropriate questions to adjust games to the specific student needs and to maximize learning and participation (Doolittle & Girard, 1991; Ellis, 1986).

The rationale behind this study was based on the suggestion that wikis created by teacher candidates may deepen the understanding of the TGfU approach, as well as the knowledge of the skills and tactics involved in games. Secondly, wikis support a collaborative learning environment where students work together with other students and their professor to foster the use of collaboration which may lead to effective scaffolding of learning. Instructional scaffolding was first introduced by Vygotsky (1978) and it refers to a teaching strategy where students build on their own and their peers' knowledge to construct new knowledge (Bruner, 1984). Additionally, the convenience of a virtual learning environment the wiki provides may alleviate the frustrations of students working on a group project outside of class time (Colbeck, Campbell, & Bjorklund, 2000; Crookall, Jacobs, Hussein, & Ismail, 2001). Finally, by providing teacher candidates with an opportunity to use a new technological tool, these future teachers may gain the experience they need to implement a wiki in their own teaching practice.

### Statement of the research question

In this study, I ask: *What are the perceptions of physical education teacher candidates regarding the usefulness of wikis as an instructional tool to enhance learning through a collaborative group project?* The following sub-questions guide the research:

1. What are the experiences of PE teacher candidates (PETC) using a wiki in a group project?
  2. How do PETC perceive the influence of wikis on their understanding of the TGfU approach?
  3. How do wikis facilitate the scaffolding of ideas to create deeper content knowledge?
- Research has shown that using a wiki can improve the writing and computer skills (Leuf & Cunningham, 2001; Mader, 2006). Two additional sub-questions were added to investigate if this wiki facilitated in the development of the writing and computer skills.
4. How do PETC perceive the influence of wikis on their writing skills?
  5. How do PETC perceive the influence of wikis on their computer skills?

Following this introduction to the research, the research questions will be informed by a review of the relevant literature in Chapter 2. Chapter 3 outlines and explains the research design, research activities, the TGfU wiki assignment and ethical considerations. Chapter 4 provides the findings based on the data analysis while Chapter 5 discusses the theoretical, research and practical implications of the findings. In Chapter 6, I will conclude this thesis with a personal reflective evaluation of the research and the implications for further research.

## CHAPTER TWO

### Review of relevant literature

This study involves the connection of technology and games education. In this review of literature, I begin by introducing the theoretical framework that forms the foundation of this investigation. Second, I explore the relevant literature of Computer Supported Collaborative Learning (CSCL), wikis and the TGfU approach in teaching games. Third, I provide a link between wikis and the TGfU approach. Last, I explain the term scaffolding and examine its use as a collaborative learning process as it pertains to the use of a wiki to broaden teacher candidate's understanding of teaching games. This literature review will focus directly on the use of wikis in the context of teacher education to investigate how teacher educators might enhance learning and gain an appreciation of teaching games according to the TGfU approach.

### Theoretical Framework

As previously mentioned, when developing activities for my own teaching, I draw on constructivist principles. Doolittle (2000), a constructivist theorist in the area of online education, provides eight specific principles of a constructivist pedagogy.

1. Learning should take place in authentic and real-world environments.
2. Learning should involve social negotiation and mediation.
3. Content and skills should be made relevant to the learner.
4. Content and skills should be understood within the framework of the learner's prior knowledge.

5. Students should be assessed formatively, serving to inform future learning experiences.
6. Students should be encouraged to become self-regulatory, self-mediated, and self-aware.
7. Teachers serve primarily as guides and facilitators of learning, not instructors.
8. Teachers should provide for and encourage multiple perspectives and representations of content. (Doolittle, 2000, p. 8)

From these constructivist' principles, I wanted to know how well wikis can support this pedagogy and provide a positive addition to the learning experience. Working with the professor of the games education course, we designed a wiki that adhered as best as possible to the above eight principles. First, wikis can provide a virtual environment that may simulate real-world interactions between people. Realizing that wikis do not provide the face-to-face interaction real-life gives, wikis won't take away from the face-to-face meetings between students but will be an addition to the in-class interactions. Second, wikis provide an excellent site for social negotiation and mediation through asynchronous discussions (Raitman, Augar, & Zhou, 2005). In this study, students were encouraged to edit each other's work and then discuss their work in the discussion area within the wiki. Third, students were encouraged to create their own meaning and make the wikis relevant to their own learning and that of their peers. This wiki project included students creating their own games according to their own interests and relevant to their prior knowledge. Next, this project did not only frame the student's prior knowledge but built on it throughout the wiki assignment. This specific project was

implemented following in-class instruction on TGfU and at the end of their teacher preparation program.

The fifth principle showed the importance of continuous assessment to enhance the learning experience. Within the wiki project, teacher candidates provided the professor with a detailed outline of what they completed on the wiki and the professor, in return, could provide constructive feedback to guide and assess the learning process. For the purpose of this study and in order to evaluate the effectiveness of a wiki as an instructional tool, the professor provided feedback only when students requested it. The sixth principle requires that students should be encouraged to become self-regulatory, self-mediated, and self-aware. In this study, an introduction session provided feedback to the students on their individual responsibilities when creating a wiki in collaboration with other students. It provided instruction on what it means to engage successfully in the wiki environment. Students were encouraged to be involved in continuous communication with their peers to remain involved and engaged in the process. The seventh principle explains that the teacher will facilitate and guide rather than instruct. Even though the teacher will be available for support, as the students constructed the wikis, they were encouraged to learn from each other and build on one another's knowledge rather than questioning the instructor.

The final principle forming the foundation for pedagogy within a constructivist framework is that teachers should provide for and encourage multiple perspectives and representations of the content. Wikis present an excellent environment to incorporate the ideas and views of the diverse student population as different perspectives may create

different representations of the content described. It is up to the group of students working together to represent their own views, discuss each other's view and build consensus to create greater knowledge.

The above statements show that wikis can support the constructivist pedagogy according to its assumptions. Wikis foster the collaborative construction of knowledge with interactive websites where students construct and deconstruct their own knowledge and build on the knowledge of their peers. For example, in this study, teacher candidates constructed new knowledge by being actively involved in researching, reading and writing about the TGfU approach. In addition, the teacher candidates deconstruct what they read on the wiki to discover the underlying ideas and give meaning to what they know. According to Duffy & Cunningham (1996, pp. 181-182), "learning is a social, dialogical process of construction by distributed, multidimensional selves using tools and signs within context created by the various communities with which they interact." This collaborative environment creates dynamic interactions between learners of various backgrounds to produce a democratic community that continuously contributes to the common body of knowledge. This student-centred approach is also reflected within the TGfU approach as it shows that students are actively involved in the elaboration of adaptation strategies to improve game tactics (Hopper & Kruisselbrink, 2002). Learners are encouraged to reflect on game play in order to effectively solve problems and make decisions within the game which lead to more meaningful game play (Mahut, Chevalier, Mahut, & Grehaigne, 2001). In this study, teacher candidates used wikis to construct and

deconstruct their own as well as their peers' understanding of teaching games as promoted by the TGfU approach.

### Computer Supported Collaborative Learning (CSCL)

Computer-supported collaborative learning is an innovation to improve teaching and learning with the help of computers (Cho, Gay, Davidson, & Ingraffea, 2007). Collaboration refers to instructional methods whereby students are encouraged or required to work together on a common goal by sharing knowledge, learning and building consensus (Littleton & Hakkinen, 1999). Most of the research in the area of CSCL has been produced by researchers in the field of distance education (Choy & Ng, 2007; Thompson, 1998). The purpose of CSCL is to encourage collaboration, scaffolding, and learning in online education courses. CSCL creates a supportive learning environment to facilitate group work where face-to-face communication is not feasible. Although most CSCL research is found in the area of distance education, collaborative learning has shaped both distance education and face-to-face education models (Dede, 2004).

Dede (2004) suggests that “most people prefer face-to-face interaction, but find the convenience of just-in-time, anyplace access to others often outweighs the disadvantages of distributed sharing of ideas, experiences, and support” (p.12). Research has shown that collaborative learning creates an externalization of knowledge by monitoring each others' learning and negotiating meaning which may trigger individual cognitive processes and eventually lead to individual knowledge construction (Webb & Palincsar, 1996). In addition, Vygotsky (1978) argues that collaboration can provide a child with a higher level of competence by enhancing into the zone of proximal

development. He describes the zone of proximal development as “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (p.86). Vygotsky attests to the importance of collaboration in acquiring new and greater knowledge. Besides the socio-cultural theory as provided by Vygotsky, other theorists have shown the benefits of collaborative learning. Constructivist theorists view knowledge as an active accumulation and construction of meaning from prior experience (Doolittle, 2000). They assume that students who work together collaboratively will bring their own perspectives and experiences to the activity, show different views, negotiate and generate various meanings and create a common understanding to build knowledge (Sherman, 1995).

The socio-cultural theory (Vygotsky, 1978), constructivist theory (Sherman, 1995), and many other theories such as problem-based learning (Hmelo-Silver, 2004), distributed cognition (Oshima, Bereiter, & Scardamalia, 1995), situated learning (Brown, Collins, & Duguid, 1989) and instructional scaffolding theory (Bruner, 1984; Hogan & Pressley, 1997) have made valid contributions to the collaborative foundation of CSCL. The above theories assume that students will create their own meaning as they construct meaning within an authentic environment, which promotes multiple perspectives that may connect with students’ prior knowledge.

Computer supported systems such as a wiki can be tools to enhance collaboration efforts among groups of students. Wikis may provide an opportunity to scaffold, facilitate deeper understanding, and promote inquiry that focuses on collaborative learning.

Computer-Supported Collaborative Learning environments such as wikis can potentially support collaborative learning by providing a medium of communication which gives learners an opportunity to compare different perspectives as they use, create, and share information between different communities of learners (Goldman-Segall & Maxwell, 2002).

### Wikis

*What is a “wiki”?*

Ward Cunningham, the creator of the original wiki called it “the simplest online database that could possibly work” (Leuf & Cunningham, 2001, p.15). The word wiki was legitimized after Cunningham visited the Honolulu airport where shuttle busses are called “wiki wiki”, which means “quick” in Hawaiian (Long, 2006). The fact that a wiki was named after the super fast shuttle refers to the easy and quick way people can set up and use a wiki. In the most common of languages, a wiki is described as a webpage that anyone can edit (Leuf & Cunningham, 2001). Leuf and Cunningham define a wiki as a “freely expandable collection of interlinked Web pages, a hypertext system for storing and modifying information – a database, where each page is easily editable by any user with a forms-capable Web browser client” (p.14). The most famous wiki known to many people all over the globe is “Wikipedia” (<http://en.wikipedia.org>). Wikipedia is a multi-language, web based encyclopedia which encourages on-line collaboration and interaction by millions of users around the world (Wales, 2001).

### *Why use “wikis”?*

Wiki is a computer supported collaborative learning tool where users may edit any page or create new ones. Wikis promote collaboration between users and are inherently democratic as every user has the same capabilities (Leuf & Cunningham, 2001). Wikis are easy to use as they refrain from utilizing complicated computer language or codes. All wikis are designed the same and use the five common features: editing, links, history, recent changes and search tools (Choy & Ng, 2007). A Wiki is an example of “social software”: it creates a virtual environment for groups of people to collaborate with ease (McKiernan, 2005). Wikis are used in a variety of settings such as institutions of higher education (Lamb, 2004; Schwartz et al., 2004), businesses (Berkman, 2004) and libraries (McKiernan, 2005). The technological aspects of the wiki encourage a collaborative tactic to group projects that is different from those incorporating the more traditional face-to-face approach.

### *How do wikis work?*

Wikis allow online asynchronous communication and group collaboration. Wiki contributors hold both author and editor privileges and they can edit the overall organization of contributions as well as the content itself. When using a wiki, you can incorporate sounds, movies, and pictures right into the wiki. According to Augur, Raitman and Zhou (2005), “wikis have two states, *read* and *edit*. Wikis are in *read state* by default. *Read state* means that the wiki page looks just like a normal webpage... When the user wants to edit the wiki page, they must access the wikis *edit state*” (p.96). In order to edit a page, some wikis require you to sign in using a username and password, while

other wikis are free for anyone to edit without a username. By clicking on the edit button featured on the wiki in real state (see Figure 2), you can access the edit state of the page you were visiting (See Figure 3). The examples showed are from Wikipedia ([www.wikipedia.org](http://www.wikipedia.org)), a webpage that uses the MediaWiki, identical to the one used within this study.



Figure 2. The 'real state' of the Wikipedia page on the University of Manitoba (2008a).

When you click the 'Edit' button, the raw text is sent to the browser in an editable form so users can modify the content of the page. When you wish to save the content you created, you click the 'Save' button and this will send the modified text back to the original page where the existing text is now replaced by the modified text. A 'What You See Is What You Get' (WYSIWYG) editor allows this process to occur (Leuf & Cunningham, 2001). While some wikis require the user to know wiki syntax to assist in formatting the wiki content, MediaWiki, the wiki used for this study, does not require the user to know wiki syntax. MediaWiki uses an editing toolbar where the user can type in the text and format the content just by clicking the formatting toolbar. This is similar to the Office Word toolbar. The reason why wikis are appealing tools for education is that

there is no need for anyone to know complicated HTML codes in order to edit text on the wiki.



Figure 3. The 'edit state' of the University of Manitoba Wikipedia Page (2008a).

Another feature of the wiki is the 'History tab' (See Figure 4). When users access the History page, they can locate all the versions of the wiki text from the newest version to the oldest version. Using the revision history, the wiki user can view the changes in red and restore a previous version of the wiki article if required (Figure 5).

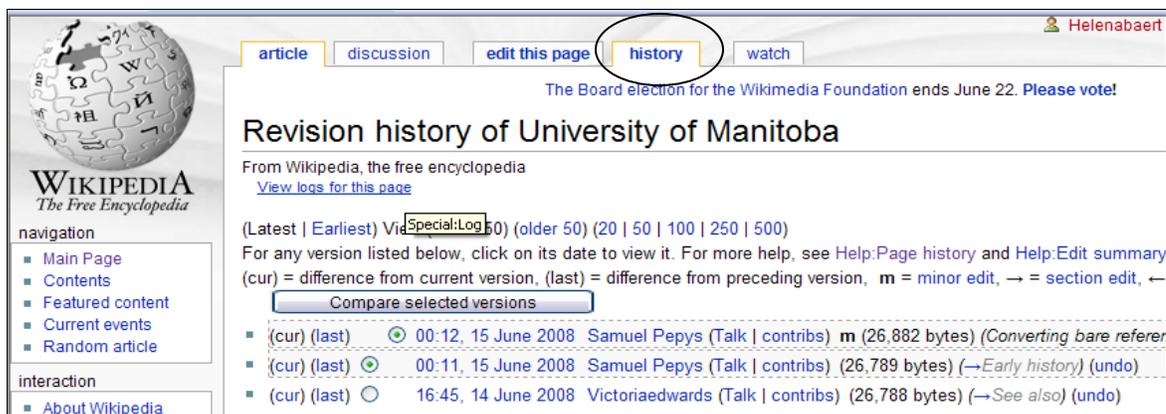


Figure 4. History Page on the University of Manitoba Wikipedia Page (2008a).

**Vitamin C**

From Wikipedia, the free encyclopedia  
(Difference between revisions)

Revision as of 17:48, 23 February 2007 (edit)  
Lumos3 (Talk | contribs)  
(←Plant sources - Remove special mention of Amla, its already in the table)  
← Older edit

Current revision (04:17, 24 February 2007) (edit) (undo)  
Jrockley (Talk | contribs)  
(remove vandalism and cleanup scurvy section)

Line 73:

<p>=== Deficiency disease ===</p> <p>[[Scurvy]] (a form of [[avitaminosis]]) results from lack of vitamin C, <b>which is required</b> for correct [[collagen]] synthesis <b>in humans</b>. Scurvy leads to the formation of liver spots on the skin, spongy gums, and bleeding from all [[mucous membrane]]s. The spots are most abundant on the thighs and legs, and a person with the ailment looks pale, feels depressed, and is partially immobilized. In advanced scurvy there are open, [[suppurator suppurating]] wounds and loss of [[teeth]].</p> <p>Scurvy was <b>at one time</b> common among [[sailor]]s, [[pirate]]s and others who were on [[ship]]s that were out to sea longer than perishable [[fruit]]s and [[vegetable]]s could be stored <b>and by</b> [[soldier]]s <b>who were similarly separated from these foods for extended periods</b>. It was described by [[Hippocrates]] (c. 460 BC–c. 380 BC). Its cause and cure has been known in many native cultures since prehistory. For example, in 1536, the French explorer [[Jacques Cartier]], exploring the [[Saint Lawrence</p>	<p>=== Deficiency disease ===</p> <p>[[Scurvy]] (a form of [[avitaminosis]]) results from lack of vitamin C, <b>as an effect of its requirement</b> for correct [[collagen]] synthesis. Scurvy leads to the formation of liver spots on the skin, spongy gums, and bleeding from all [[mucous membrane]]s. The spots are most abundant on the thighs and legs, and a person with the ailment looks pale, feels depressed, and is partially immobilized. In advanced scurvy there are open, [[suppurator suppurating]] wounds and loss of [[teeth]], <b>and eventually, death</b>.</p> <p><b>Historically, scurvy was common among those with poor access to fresh fruit and vegetables, such as</b> [[sailor]]s, [[pirate]]s and others who were on [[ship]]s that were out to sea longer than perishable [[fruit]]s and [[vegetable]]s could be stored, <b>as well as isolated</b> [[soldier]]s. <b>The earliest documented case was</b> described by [[Hippocrates]] <b>around the year 400 BC</b>.</p>
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*Figure 5.* Illustration of the difference between two revisions of a Wikipedia article as displayed by MediaWiki (2008b).

A wiki also provides the user with a space to collaborate and share ideas by using the discussion tab. The user may choose to add text to the discussion section by clicking the edit button (Figure 6) or by clicking the + button (Figure 7). When the + button is clicked, it allows users to create discussions in thread form. Thread mode allows wiki users to hold a conversation in chronological order, where the newest comments are presented before the older comments. The edit mode allows wiki users to change the text on the discussion forum just as you would on the article.

One last feature of a ‘MediaWiki’ wiki is its ability to receive emails when someone has changed or updated the wiki text. By clicking the ‘Watch’ button, the user will establish a ‘watch list’ that will provide a summary of all the recent editing activities of the watched page. The watch list is a useful tool that can let you know where a change

happened on a page that you are interested in. A teacher can create a watch list that includes the wiki pages the students are working on and will receive a summary of everything that has changed to prevent the teacher from reviewing all the individual wiki pages.



Figure 6. Illustration of a discussion section using the edit format.



Figure 7. Illustration of a discussion section using the thread format.

### Wiki collaboration

While wikis allow students to publish content, they also assist in the development of collaborative skills such as negotiating with others and building on each other's ideas

(Richardson, 2006). The term collaborating can be perceived in many different ways and it is vital to understand its meaning in the context of a wiki. When using wikis, students collaborate on projects by working together to accomplish a common goal. From students producing their own content, to building on each other's ideas through richly detailed text, wikis allow for a range of collaborative efforts. The concept of students building on their own and their peers' knowledge to construct new knowledge was first introduced by Vygotsky (1978) as instructional scaffolding (Bruner, 1984). Vygotsky defines a scaffold as an intentional assistance provided to another (1978). Research shows that in order to produce effective scaffolds, students must be able to construct, convey and comprehend explanations (Cohen, 1994; Webb, Troper, & Fall, 1995). Instructional scaffolding is often used when students are learning more complex concepts. When assistance, such as scaffolds, are provided, knowledge acquisition increases and students become more independent and self-reliant learners (Cohen, 1994; Webb et al., 1995). For the purpose of this study, I took a closer look at the role of scaffolds when using wikis in an education context.

#### *Using wikis in the classroom*

In higher education, wikis are commonly used as tools of collaboration to support a community of learning (Engstrom & Jewett, 2005). According to Engstrom and Jewett, "Wikis are collaborative environments by design, and can serve a variety of purposes for collaborative online projects" (p.12). These collaborative learning environments can support conversational interaction, social feedback and social networks which may assist in building new relationships (Boyd, 2003) and creating new knowledge. Collaboration in

education also encourages scaffolding as students assist each other by building on previous knowledge in order to arrive at something new. Students are encouraged to collaborate and give constructive feedback in order to create new knowledge. Bruner (1984) argues that the teacher should try to encourage students to discover new knowledge themselves, as well as through an active dialogue between peers. He adds that the use of technology could in fact increase the motivational level of the learner due to its interactive nature and its ability to support collaboration.

### *Wikis in Manitoba*

As part of my interpretive inquiry, I felt it was necessary to discover how teachers within Manitoba use wikis to facilitate group work projects. To that end, I will briefly outline the use of wikis in both a public school and university setting. Clarence Fisher, a grade seven and eight public school teacher in Snow Lake, Manitoba created a wiki that allows his students to collaborate with students located in Los Angeles, California, U.S.A. on specific topics in the subject area of language arts and social studies. Fisher has been named a Manitoba Middle Years Outstanding Educator, and received one of Canada's highest teaching awards, the Prime Minister's Award for Teaching (Hall, 2007). This recognition stems from his work on the integration of technology into the daily classroom. Fisher commented that wikis empower students to become legitimate producers of information as wikis give the students a voice of their own. Because students can access the wiki at home and at school, wikis expand the school day and allow for international collaboration among students (C. Fisher, personal communication, December 2, 2007). Remote Access (Fisher, 2007), a website created by Fisher displays a

variety of technologies used within the classroom. He views technology as a means to assess, evaluate and produce content and teach students about literacy in an interactive manner.

Christina Penner, a computer science instructor at the University of Manitoba, has her third and fourth year computer science students employ a wiki to design a textbook for first year students. Within the wiki textbook, each student is responsible for creating and editing one section. Penner claims that the most difficult aspects of using wikis are exposing the writing process and giving over her control to her students (C. Penner, personal communication, November 27, 2007). Research shows that wikis act as a disruptive technology, changing the way students look at text, as they become authors of their own ideas and are in complete control of the content they create (McKiernan, 2005). According to Penner, giving up complete control is what concerns teachers so much when implementing wikis in their classes. Yet this same factor is what makes a wiki so powerful. Penner affirms that wikis allow her students to create a “living text” which can change the way they think about the content of other written works. By taking part in a wiki project, she believes that students come to realize that text is not necessarily absolute or “pure truth”, but that the reader must critically evaluate what is written and espoused as fact.

#### *Factors to consider when using wikis in classrooms*

The literature shows several ways to promote collaborative learning through the use of wikis (Choy & Ng, 2007; Engstrom & Jewett, 2005; Raitman et al., 2005; Wang & Turner, 2004). First, because of the easy set-up and edit features, all students, even those

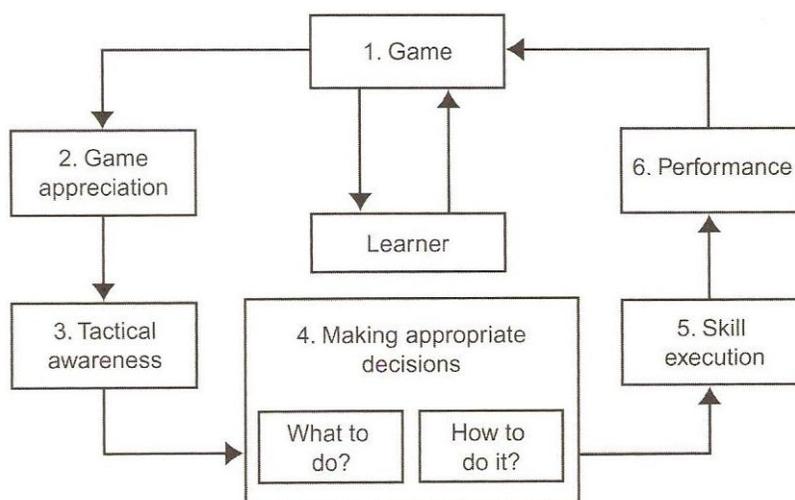
students without prior knowledge of computer software technology, can use wikis. This allows anyone to become an editor as well as a publisher. Second, as wikis exist online, students can gain access and participate from any location as long as they are able to use a computer with internet access. Third, wikis may provide added support to learning in the classroom as participants reflect and engage in hands-on group interactions on their own time. This creates flexibility and a sense of ownership, active involvement, and control of learning. Last, increased knowledge and skills in literacy and technology enhances the learning of students at a multi-disciplinary level.

Besides the multiple benefits wikis present, researchers have found several issues related to the effective use of wikis in education (Choy & Ng, 2007). The success of collaboration relates to the instructor's ability to engage students to become active learners and participants. As anyone can create, edit, and even erase entire pages of information, security tools need to be in place to exert more control over the content of the page. Additionally, the wiki-community or students creating the web pages act as a control. It is important that users back up the content of the page frequently to avoid losing valuable information. In essence, even though wikis have some challenges that students and teachers should be aware of, according to the evidence provided above, the benefits seem to outweigh the challenges. When students obtain more autonomy by improving the quality of their own work and that of others by learning through communication, negotiation, and collaboration, they can in fact learn to teach each other.

## Teaching Games for Understanding (TGfU)

### *What is the “TGfU” approach?*

David Bunker and Rod Thorpe first published the “Teaching Games for Understanding” model in 1982. It is a six step approach (Figure 8) to create a student-centred games education that links tactics and skills in game settings (Bunker & Thorpe, 1982).



*Figure 8.* Original Teaching Games for Understanding model (Griffin & Patton, 2005, p. 3)

Bunker and Thorpe (1982) suggest that the design of a well-structured game increases decision making and therefore, students gain a greater understanding of games (Griffin & Patton, 2005). First, the teachers design a modified version of the game to meet the developmental needs of the students. Second, students acquire game appreciation by understanding the rules of the game. Next, students increase their tactical awareness by working through the principles of play. In the fourth step, students learn to problem solve and make effective decisions related to the tactical and technical features of the game.

Fifth, students focus on skill improvement within the context of the game. The final step within the TGfU approach centers on the performance criteria that will enhance learning and create players that are more competent (Hopper & Kruisselbrink, 2002).

As Griffin and Patton (2005) state, the TGfU approach considers four pedagogical principles on which teachers should base their instruction: i) game sampling gives students an opportunity to explore the similarities and differences among different games; ii), representation involves modified lead-up games that contain the same tactical structure of the formal game; iii), exaggeration involves changing of the secondary rules and iv), tactical complexity involves matching the game to the developmental level of the students (Griffin & Patton, 2005). Thorpe, Bunker and Almond (1986) used four categories to classify the games, all of which used an implement: invasion/territory, striking/fielding, net/wall and target games. The authors used these categories to form a conceptual framework to learn common tactical concepts that transfer to many different games within a certain category. For example, students can learn offensive and defensive strategies through a game of soccer, which may later transfer to a game of basketball, for example: “give and go.” The key focus of the TGfU approach is that students first learn what to do in a game in order for them to make decisions on the strategies and skills they need to know to play successfully (Hopper & Kruisselbrink, 2002).

### *Teaching TGfU*

Implementing the TGfU approach has a variety of implications for teaching and learning in physical education (Hopper, 2002). According to Hopper, teachers must consider several criteria when teaching a tactic-to-skill progression. First, teachers must

provide a warm-up related to the tactics and skill progressions to be introduced in the lesson. Second, teachers will create a modified game where students will focus on tactics as they develop decision making skills. Third, using effective questioning and working with the students' answers, teachers will create a shift from tactics to skill in order to refine the game performance. Next, teachers will challenge the students and further develop the tactical awareness by offering closer approximations to the formal game structure. In the fifth step, the teacher will need to reflect and modify the game depending on whether or not the game meets the students' needs. In addition, teachers need to be constantly aware of how students practice skills within the game in order to focus on becoming a successful game player rather than a technically skillful player.

Finally, Hopper suggests that if teachers cannot meet any of the above criteria, they should realize that a change in focus might be in order to transfer from "teaching games with no understanding to teaching games for understanding" (pg. 47). Vigilant reflection and evaluation of program progress is required to uphold the quality of the program. All the above criteria encompass the pedagogical content knowledge (PCK) teachers need to effectively teach a quality program (Shulman, 1986). It is up to teacher education programs to invigorate students with the "capacity to transform the content knowledge teachers possess into forms that are pedagogically powerful yet adaptive to the variations in ability and background presented by students" (Chandler, 1996, p. 51).

#### *TGfU and PETE*

The curriculum of physical education/health education in Manitoba encourages teachers to use the TGfU approach as a way to effectively teach games (Manitoba

Education, 2000). The early years' curriculum focuses on developing the basic movement skills while the middle years' PE curriculum gears towards teaching games using the four distinct TGfU categories. In senior years, students acquire activity-specific movement skills for lifelong physical activity. The TGfU approach fits within the Manitoba PE curriculum framework and teacher preparation programs within Manitoba should therefore be encouraged to use it as an instructional model for teaching games.

Researchers (Bell & Hopper, 2003; Doolittle & Girard, 1991; Ellis, 1986; Griffin, Dobbs, & Rovengo, 1996; Smith, 1991; Turner & Martinek, 1995; Werner, 1989; Wilson, 2002) generally seem to agree that teaching games successfully according to the TGfU approach requires a high degree of content knowledge. Teachers must first understand the complexities of both skill and tactical progressions of games. Additionally, teachers must know how to select games developmentally appropriate to the needs of students and finally, teachers need to learn how to ask suitable questions to engage students as active participants of their own learning. Howarth (2005) explains that a "focus on meaning, authenticity, and the learner as active participant can be a problem for pre-service teachers who lack experience in content and how to relate to and motivate students" (p.96). When using the TGfU approach, teachers must make suitable cognitive demands of students to encourage them to be active in the development of tactical understanding (Howarth). According to Howarth, teacher educators have commented on the lack of time they have to "teach games content and innovative instructional models such as TGfU" (p.101). As I explored in this study, wikis may provide for additional time to discover games content and develop a richer understanding of teaching games.

The lack of time to teach pedagogical content knowledge in PE is connected to the rigorous debate regarding the value of “sports performance coursework” within academia (Siedentop, 2002). Siedentop’s 2002 paper explains the following:

The root problem which has allowed the discipline movement to virtually take over and increasingly define pre-professional curricula in physical education is, from my view, straightforward. There is a general belief that sport performance coursework is not worthy of academic status, or, even more directly, that sport itself is academically unpalatable. (p. 371)

This debate is as valid today as it was in 1986 (Shulman, 1986). In PE, a large portion of instructional time is dedicated to teaching games, so the need for teacher candidates to learn the history of games, philosophy of teaching games, tactics and skills related to games, is extremely important. Even though there is a continuous struggle to increase the value of sport/games content knowledge within PE preparation programs, finding innovative ways to increase content knowledge without increasing the amount of credit hours is an underlying motive to this research. This study shows how wikis can be used as an instructional tool to gain deeper understanding of the content knowledge of games.

#### Wikis and TGfU: the Link

The complex nature of TGfU corresponds to differentiated processes of knowledge acquisition and learning. In theory, a collaborative wiki should work to enhance such acquisitions. The rationale behind this link is based on the supposition that wikis created by teacher candidates may deepen the understanding of the TGfU approach,

as well as the knowledge of the skills and tactics involved in games. Second, wikis support a collaborative learning environment where students work together with other students to foster the use of collaboration and which may lead to effective scaffolding of learning. In addition, it is vital to realize that teacher candidates in PETE programs begin their teacher education with various educational backgrounds; some have prior knowledge of the TGfU approach, others have little to none. Using tools such as a wiki can support teacher educators to challenge teacher candidates who possess different degrees of PCK in their acquisition of knowledge.

This summary of relevant literature suggests that wikis may, in fact, be a positive addition to the classroom. It also reflects the need to create instructional tools that enhance students' understanding of the content that is often complex in nature. This literature review provides evidence of both the challenges and benefits of using online collaboration tools to enhance learning. This study builds on the literature by examining and evaluating the influence of wikis on developing pedagogical content knowledge. Additionally, wikis may accommodate collaboration among students through the use of scaffolding, and minimizing frustrations and anxiety related to group work.

## CHAPTER THREE

### Methods

This study examined how physical education teacher candidates perceived the use of a wiki, as an instructional tool, toward developing a greater understanding of teaching games as described by the TGfU approach. In addition, this study investigated the experiences of teacher candidates using a wiki during a group project. Using qualitative research methods provided suitable information directly from the teacher candidates on how their use of wikis, as part of a group project, influenced their individual learning. According to McMillan (2008), qualitative research generally incorporates some or all of the seven key characteristics: “natural setting, direct data collection, rich narrative descriptions, process orientation, inductive data analysis, participant perspectives, and emergent research design” (p. 272). These characteristics are not absolute, as Patton (1990) points out but rather are “strategic ideals that provide direction and a framework for developing specific designs and concrete data collection tactics” (p. 59).

To begin, qualitative research involves studying the participants within their natural setting (Denzin & Lincoln, 1998; McMillan, 2008). When entering the world of the participants, qualitative researchers attempt to interpret the meanings people bring to a particular phenomenon (Denzin & Lincoln). In this study, I observed the online wiki history (i.e., an outline of all the entries made by the wiki contributors), and monitored the participants’ personal experiences and perceptions through their reflective journals. Qualitative researchers want to be in direct interaction with the participants as much as possible to form a comprehensive understanding of the experiences shared. For this

reason, I lead four focus group interviews that engaged the teacher candidates in direct discussion while providing an opportunity to listen to their thoughts and experiences and observing the characteristics of the group dynamic. I suggested to the teacher candidates that personal interviews could be arranged upon request if they felt more comfortable discussing their perceptions away from the group, however, none chose to partake in a personal interview.

Second, in qualitative research, the researcher acts as the primary instrument of the data collection (Eisner, 1991; McMillan, 2008). As a researcher it is crucial to understand that we bring our own thoughts, beliefs, values, and perceptions to the research, and that, if not examined and fully explored, could influence the interpretation of the results in ways that are not transparent (Denzin & Lincoln, 1998). In this regard, it is important that my interpretations support the data.

Third, a qualitative study involves keeping a detailed record of the observations of each situation in order to gain a deeper understanding of the perceptions and the experiences of the participants (McMillan, 2008). This thesis purposefully provides detailed descriptions that reflect the complexity of the behaviors presented.

Fourth, to understand how and why behaviours occur, qualitative research looks at the process through which these behaviors occur. As the interpretive loops suggest, looking at each step within the process will guide the path of the inquiry. In this particular study, I examined the reflective journals from each week of the assignment in order to create a deeper understanding of how wikis affected learning and group work as this project unfolded.

A fifth characteristic within qualitative research closely relates to the fourth. Rather than formulating hypotheses, qualitative researchers begin the study with a question related to their concerned engagement and as the study proceeds, the research is open to new ideas and understanding. The process is what guided the research and even though the data may seem unconnected at first, as this process continues the research will become more specific in nature.

Sixth, as this study examined the perceptions of teacher candidates, I attempted to reconstruct the participants' perspectives, as they perceived them. It is the researcher's task to create meaning of the events reported by the participants. Quotes and textual examples are used to express the meaning, thoughts and actions the research participants communicate. Yet, in the end, I recognize that the final written analysis represents my own interpretation of the participants' experiences.

Lastly, qualitative research uses an emergent research design (McMillan, 2008). Going through the interpretive loops, data emerges and themes appear which may as a result, influence the next step within the research process. Although I had some idea of how this research would flow, I remained flexible to emerging ideas stemming from observing the wiki environment, the interactions between the participants, and their personal reflections. These had a direct influence on the data analysis process. Using an interpretive inquiry method allowed me to be open to emerging themes, which ultimately dictated the course of the research.

## Research Activities

This interpretive inquiry employed several qualitative techniques to collect data on PE teacher candidates' perceptions regarding the influences of wikis on learning and collaborative group work. I began this process by asking a research question: "What are the perceptions of physical education teacher candidates regarding the usefulness of wikis as an instructional tool to enhance learning through a collaborative group project?" Next, I identified the group of participants enrolled in a physical education teacher education course (See Course Outline, Appendix A). Prior to the start of this project, the professor gave her verbal consent to participate in a research project studying the use of wikis within this Senior Years PE course. Following university ethics approval, both the Dean of the Faculty of Education (See Appendix B) and the professor (See Appendix C) received a consent form outlining the ethical considerations and research design. The teacher candidates were invited to volunteer to take part in the study and were asked to sign a standard academic consent form (See Appendix D). In collaboration with the teacher candidates' professor, we outlined the wiki assignment (See Appendix E), and created the pre and post writing samples and the reflective journal questions. The teacher candidates then participated in a six-week project using wikis to enhance their understanding of the TGfU approach in teaching games.

Before introducing the students to the wiki, they were required to complete a pre-writing sample (See Appendix F). The teacher candidates then participated in a computer workshop delivered by a technical support person from the university who helped them to become more familiar with the format and operation of a wiki. The professor then

presented the teacher candidates with an outline on the assignment and an explanation of the required tasks involved in the wiki project. Additionally, the students were randomly assigned to each of the four game categories (invasion, target, net/wall, striking/fielding). From this point on, the students worked on the wiki outside the regular classroom. Each week the teacher candidates were required to complete the tasks as outlined in the Wiki/TGfU project schedule (See Appendix G). At the end of each week, the teacher candidates were also required to complete a reflective journal (See Appendix H). As the students progressed through the project, I continually collected qualitative data by conducting observations of the teacher candidates' entries as highlighted by the history section of the wiki.

Upon completion of the wiki project, the students submitted a post-writing sample (See Appendix I). The pre- and post-writing samples parallel each other in design and they include four open-ended questions related to TGfU and group work. Additionally, the journal contained a small survey using twelve Likert-type scale (Tashakkori & Teddlie, 2003) questions, in order to obtain information about how wikis may assist in enhancing computer and writing skills. During the final stage of the study, the teacher candidates in their TGfU groups were invited to participate in a 30 minute focus group discussion outside the regular course setting. This occurred during class time, which allowed them to express their opinions on using wikis. If the participants preferred to discuss their opinions in private, I offered to arrange a personal interview. During the interviews, I directed the discussion by posing two principal questions and an additional set of sub-questions, in order to elicit further dialogue on the use of wikis in a

collaborative setting (See Appendix J). A repeat of the same discussion format occurred with the other three groups. During the focus group discussions, I audio-recorded the 30 minute conversation as well as took detailed notes on the perceptions expressed by the teacher candidates. This concluded the data collection portion of the study. See Appendix K for an outline of the research schedule.

Following the collection of the data, I analyzed, consolidated, and interpreted the information to unveil specific nuances, patterns, and understandings from the PE teacher candidates' insights. I first transcribed the focus groups' audio recordings and later, coded and constructed meaning from the information collected. Once I interpreted all the information, I made sense of the results by connecting the findings to the research questions to formulate the conclusions. A more detailed description of the design process follows.

### Participants

This study involved a cohort of 28 final year male and female Physical Education Teacher Candidates enrolled in a teacher education program. Upon completion of the program, the students earn a Bachelor of Education degree and may apply to receive a Manitoba teaching certificate. The participants in this study were all part of the course Teaching Physical Education in the Senior Years, which started in September of 2007 and ended in April 2008. Of the 28 teacher candidates within the course, 27 participated in the wiki/TGfU assignment. In the second semester of the course, students created a wiki to enhance their understanding of the TGfU model and its application to teaching games. Even though the wiki project is a mandatory requirement within the course,

participation in the research study was voluntary and the students could have asked the researcher to withdraw all written documents from the research at any given time.

### The Wiki Assignment

The objective of the wiki assignment was two-fold. First, wikis were used to facilitate an in-depth inquiry/dialogue about the TGfU approach. And second, this project was designed to evaluate the use of wikis within a collaborative group assignment. The class was divided into 4 groups, by drawing numbers from a hat. There were 7 sets of numbers from 1 through 4. Once the names were drawn, another draw was held to decide the category for your group:

- # 1 Net/Wall
- # 2 Invasion/Territory
- # 3 Striking/Fielding
- # 4 Target

The professor dedicated two classes to provide the students with assignment objectives and expectations. The expectation was that the groups build on each others' ideas from week to week. According to McKenzie (1999), in order for learning to occur students must be provided with a clear and complete outline of the scaffold and the levels involved. In this study, the professor provided the teacher candidates with headings, or scaffolds to guide their research on the TGfU approach. However, only one part of the entire outline of the scaffolds was offered to the teacher candidates at a time. After one or two weeks, the teacher educator would provide a second part and later on a third part, which concluded the entire assignment. These scaffolds were provided to each group of

teacher candidates and throughout the six weeks, the teacher candidates were responsible for entering and editing information under each scaffold (see Figure 9). When headings were provided, teacher candidates were encouraged to create their own knowledge based upon what they had learned in the past and what they had discovered from their research.

1. Overview of TGFU approach
  - History
  - Philosophy behind the model
  - The model (diagram: adapted from original model))
  - Explain/Describe each step in the model
  - Exaggeration, simplification, modification.
2. Overview of Specific Category: Net/Wall, Striking/Fielding, Invasion/Territory, Target
  - General information about category
  - Transferable skills, strategies and tactics
3. Game Progression
  - a) Game Sequence # 1
    - Tactical Problem/Focus
    - Skill Focus
    - Introductory task or game must include: Description, Representation, Simplification, Exaggeration, Modification and Questions
    - Skill/Concept development through Task/Game: 2 games that both must include: Description, Representation, Simplification, Exaggeration, Modification and Questions
  - b) Game Sequence # 2
    - Tactical Problem/Focus
    - Skill Focus
    - Introductory task or game must include: Description, Representation, Simplification, Exaggeration, Modification and Questions
    - Skill/Concept development through Task/Game: 2 games that both must include: Description, Representation, Simplification,

*Figure 9.* The three sections with scaffolds/headings

Teacher candidates were to refer to a schedule to understand due dates and submissions. Each week, each group member was expected to contribute to the wiki in two ways: a) add to the text of the project with additional research and ideas; b) edit sections of the project. There was no maximum number of entries per week, but there was a minimum of 1 entry for both a) and b) as described above. Additionally, every Friday, each student was required to submit their “reflective” journal to the professor during class.

#### Delimitation to the study

The objective of the study was to discover how teacher candidates perceived the use of a wiki in a collaborative project. In order to evaluate whether the wiki could be self-sustainable as an instructional tool for collaborative group assignments, the professor and I collaboratively agreed to keep professor involvement in the wiki assignment to a minimum. The tasks of the professor included: providing the teacher candidates with the assignment outline, creating an opportunity for teacher candidates to learn about the wiki technology in a workshop lead by a technician, assigning and collecting the pre and post writing samples and journals and providing a structure of headings (scaffolds) on the wiki. These scaffolds will be explained in the following section. The professor would refrain from initiating conversations regarding the wiki project unless the teacher candidates requested assistance. In that case, the assistance was documented. Following a conversation with the professor at the end of the study, it appeared that the teacher candidates did not ask questions and the wiki project was only discussed after it was completed. As a researcher, I see this delimitation as an important method for

determining the effects of the wiki; however, I also realize that some of the issues that emerged from the data may have been caused by the minimal involvement of the teacher.

#### Ethical considerations

Prior to meeting the teacher candidates, both the Dean of the Faculty of Education and the professor provided me with their consent to participate in this study. Following the wiki/TGfU assignment, I introduced the research project in a face-to-face meeting with the 28 teacher candidates enrolled in the course. In this personal introduction session, I presented the study according to the script in APPENDIX L and handed out the consent forms. They all received two copies of the consent form, one for them to keep and one to give to me, explaining the purposes of the study. Further, the consent form established the method by which the collection, storage, analyses, and presentation of the data occurred. The form included the research goals, objectives, parameters, and duration of the project. It informed the participant that the study is voluntary and that they may choose to withdraw from the study at any time without the need for further explanation or concern for prejudice.

To ensure anonymity during the analysis of data, each participant was assigned a pseudonym and all other names and identifying characteristics were changed to minimize the possibility of identifying the sources of the information. All interviews were transcribed and coded for confidentiality purposes. The researcher was not involved in the assessment/evaluation of the project and refrained from discussing themes or results stemming from the study with the professor until the wiki project was completed.

All data was securely stored in a locked filing cabinet to which only I, the researcher had access. The data will remain secure for the duration of the study and for five years after its completion, and then will be destroyed. The final research findings have been summarized and will be made accessible to the participants and may be submitted for journal publication, but no individual will be identified in any documents and anonymity and confidentiality will be ensured.

### Data collection

#### *Wiki History*

When collecting data, I began by observing the teacher candidates' daily entries on the wiki. Each wiki held a detailed history of who, when and what was written by the participants during their collaborative sessions. I examined this history record and made reflective notes on any themes and patterns emerging from the wiki.

#### *Document Analysis*

Document analysis was the second method employed to collect relevant data for my research. Working together, in cooperation with the professor, we designed the research documents to complement both our needs. For the professor, these documents supported the assessment/evaluation of the students' work, while these same documents provided me with the participants' individual perceptions. The study obtained first hand accounts of the participants' experience using a wiki through the collection of writing samples and reflective journals.

### *Pre- and Post-writing Sample*

The design of the pre- and post-writing samples paralleled each other in order to facilitate a close examination of the participants' growth over time. These qualitative samples both probed the student candidates' understanding of the TGfU approach, elicited their perceptions about group work using wikis, and investigated their perception on the level of writing and computer skills. The teacher candidates produced a writing sample at the beginning and at the end of the project. The pre-writing sample generated a baseline of insights and knowledge expressed by the participants before the project commenced. The post-writing sample evaluated the students' perceptions on their individual growth in understanding the content.

### *Reflective Journals*

The reflective journals provided me with an opportunistic window into the personal thoughts and beliefs held by teacher candidates regarding group work, collaboration, and the use of wikis. I also used the reflective journals to track the teacher candidates' rationales for creating, editing, and removing text from the wiki. This generated an overview as to whether or not teacher candidates scaffolded ideas to create a deeper understanding of the content. Finally, the data collected from these documents supported the information gathered previously from the wiki history. It also provided the background information necessary to facilitate the discussions in the focus groups.

### *Focus Groups*

Upon completion of the project, I met with four focus groups to gain a greater insight into the experiences of the groups using the wiki. The data collected from these

discussions afforded an opportunity to compare the group feedback to the responses acquired through the individual journal submissions. The comparison shed light upon whether or not any similarities or differences occurred between what was stated during the focus group discussion and those insights expressed previously by the individuals. Further, it provided insight into the influence that the group dynamics had upon the outcomes generated. A cross comparison between the four focus groups interviewed elicited both parallels and/or disparities between the group dynamic with respect to their understanding of the TGfU approach.

Focus group discussions are about listening to and creating a comfortable environment to allow people to share their thoughts and opinions (Krueger & Casey, 2000). Krueger and Casey state that a focus group consists of “people who possess common certain characteristics, and provide qualitative data within a focused discussion to help the researcher understand the topic of interest” (p.10). During focus group interviews, it was vital to act as a skilled mediator and facilitator as I refrained from influencing or encouraging particular responses from the participants, but rather questioned, listened, and provided participants with an opportunity to express themselves, while keeping the conversation moving and on track (Krueger & Casey, 2000). While the core questions focused on group work and scaffolding, I designed additional sub-questions to keep the discussion on point and flowing.

To ensure that the data collected accurately reflected the teacher candidates’ opinions; I used multiple data sources to provide an opportunity for triangulation.

According to Patton (1990), triangulation of multiple data sources creates convergence of the data and gives credibility to the perceptions of the participants.

### Data analyses

Analyzing data refers to organizing data into categories based on patterns, themes, concepts, or similar features (Neuman, 2003). In order to do this, I reviewed the data and took detailed notes of any emerging patterns as they occur throughout the data collection process. Upon completion of this process, I used all the writing samples, reflections, and focus group transcriptions to highlight the various patterns I observed and later organized the data according to the themes I created. I believe that the most difficult, yet exciting, aspect of analyzing the data, was to examine all of the information, connect it to the various themes that emerged and discover new themes throughout this process.

When conducting this qualitative study, I sought to gain an in-depth picture and maintained an open mind as I interpreted the information. According to Stainback and Stainback (1988), the investigator should provide an “in-depth holistic description of events, procedures, and philosophies occurring in natural settings to make accurate situational decisions” (p.1). Additionally, it is important to realize that the data analysis process requires time. Consequently, I repeated the process to reveal any themes that I may have overlooked in my initial examination.

The aim of data analysis is to break down the information, examine it, and identify common and divergent themes in order to create meaning. The themes I observed were words, parts of a phrase, sentences, or complete paragraphs. Once I identified all the themes, both regarding individual perceptions and group perceptions, I organized and

sorted the data into categories. These categories related to my research questions and the themes and patterns provided the answers.

During the analyses, it became apparent that there were a number of different ways of examining the data from the journal reflections. My investigation led me in two directions. First, I reviewed and compared each journal reflection among the various teacher candidates. Second, I reviewed and analyzed the reflections from each individual teacher candidates' response from one week to the next. This approach of the analysis provided me with the best opportunity to scrutinize individual perceptions over time as well as examine the parallels and differences in perceptions that occurred between the teacher candidates from week to week.

#### Writing the results

The presentation of the findings includes themes that I have organized in response to the research questions. When writing the results of this qualitative study, I employed several formats. Gilgun (2005) suggests that when selecting a format to be used for writing up the findings, "the presentation should be consistent with the philosophy of science on which the research is based" (p. 261). Building on a constructivist foundation and in conjunction with the use of an interpretive inquiry, the participants' voices needed to filter through the text. Therefore, I used interpretive themes and personal quotes, to reflect as authentically as possible, the teacher candidates' perceptions as they relate to the use of wikis to gain a deeper understanding of the TGfU approach. Subsequently, the sharing of personal quotes provided access to the participants' ideas and thoughts and to the meanings that words and events held for them (Ellis, 1998). When writing an

interpretive account, Ellis (1998) believes that “creating an opportunity for more shared meanings can make the interpretive account more comprehensible” (p. 32). The purpose of assembling the results is to create a vivid and authentic account of what the wiki demonstrated, what the individual students expressed, and what the group discussions revealed. In the end, it was vital for me to see the whole picture and translate that on paper.

I realized very soon that, when writing about the findings, new themes emerged and I began to see a new meaning of the interpretive loops within this inquiry. Returning to my research questions helped me frame my thought processes and allowed me to complete the data analysis. Part of attempting to provide the reader with an authentic account is to know when the research questions are answered according to the information provided by the data and its interpretation. To enable myself to complete the analysis, I evaluated the analysis according to the six questions Ellis (1998) suggests for evaluating qualitative research. Ellis explains that the following six questions can be used to assess if the reason for the study has been advanced. Although these questions do not all need answers, it may be used as a tool to evaluate your study and find further implications of the research. The six questions are:

1. Is it plausible, convincing?
2. Does it fit with other material we know?
3. Does it have the power to change practice?
4. Has the researcher’s understanding been transformed?
5. Has a solution been uncovered?

6. Have any new possibilities been opened up for the researcher, research participants, and the structure of the content?

In Chapter 6, I will outline my own reflective evaluation of the study while addressing some of the six questions Ellis posed.

## CHAPTER FOUR

### Findings<sup>2</sup>

When interpreting the perceptions of teacher candidates by means of examining the pre and post writing samples, the reflective journals and the focus group interview scripts, it was important to chart their experiences using the wiki over time. The findings are presented similarly. Whenever possible, I used the teacher candidates' words or voice to accurately describe their perceptions and experiences. To begin with, the teacher candidates' perceptions concerning their prior involvement with group work are illustrated through re-creation of their ideas as expressed in their pre-writing samples. Next, the general experiences of the teacher candidates using the wiki will be outlined. Additionally, I referred to the teacher candidates' reflective journals to chart their experiences using scaffolding to enhance their understanding of the TGfU approach while making use of the wiki. Finally, I examined closely the difficulties the teacher candidates experienced with the third section of the assignment and noted their suggestions as to how this assignment might be enhanced.

### Experiencing Group Work

#### *What is group work?*

In an effort to understand the teacher candidates' perceptions regarding the use of wikis to facilitate collaborative group work, I found it both useful and necessary to ask the participants about their prior experiences involving group work. When giving the

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<sup>2</sup> Components of these findings have been presented at two conferences: 1) a poster presentation at the International Teaching Games for Understanding conference in Vancouver, May 14, 2008, and 2) a scholarly presentation at the Physical and Health Education Teacher Education Association session (CSSE) at the Congress for the Humanities and Social Sciences in Vancouver, June 2, 2008. In addition, a paper has been submitted for possible publication in the proceedings for the International TGfU Conference.

teacher candidates an opportunity to express their views and explain their experiences through a pre-writing sample, the data revealed a universal understanding of the process of group work. This may have transpired because most of the teacher candidates within this study completed a Bachelor of Education at the same University in which they received their Bachelor of Physical Education degree and therefore completed similar coursework during their undergraduate degree. The data obtained from the pre-writing samples revealed that most course work in the Faculty of Education involved some type of group work. Most of the teacher candidates explained the process of group work as getting together outside of the regular class times to exchange roles and responsibilities, to divide the workload up amongst the group members, to email each other if they had questions and meeting again and to meet again at the end to put all the pieces together. Usually, one person was tasked with the responsibility for consolidating the work into a coherent and complete product before handing it in for assessment.

#### *Group Work Successes*

In addition to explaining the process of group work in their Faculty, the teacher candidates also revealed the successes and challenges they experienced when completing assignments as a group. One positive outcome of working in groups, that all teacher candidates shared, was the ability to enhance their knowledge base and broaden their understanding of the subject matter by amassing new information and ideas obtained from other group members. One teacher candidate explained that working together as a group allowed them to “...cover greater amount of knowledge.” A second constructive feature to group work expressed by several participants was the notion of “...shared

*responsibility...*” and the ability to “...*pass along those areas you have trouble with.*”

These opinions appear to suggest that group work was viewed to be non-threatening because the students could be assigned work according to their strengths. A final positive perception of the group work experience, resonated by the teacher candidates in both the pre-writing samples and during the focus groups, was the ease in which physical education students perform group work and are “...*easy to get along with.*” From my perspective, as a researcher, this was an important factor to consider as I collected my data.

According to the teacher candidates, “*group work among PE students seemed easier than group work with students from other subject areas.*” This perception stemmed from their belief that group work was a common practice in most of the courses they participated in during their BPE education while other faculties (for example Arts or Science) may not have incorporated group work as an instructional strategy within their courses. Speaking from my own experiences, both as an undergraduate student and as a graduate assistant, I can relate to their experiences and believe that the group work offered in the PE program has allowed students to form positive relationships with their peers that may have contributed to their comfort level in doing group work at a different faculty. However, not all their experiences were positive.

#### *Group work challenges*

In their pre-writing samples, the teacher candidates articulated their thoughts concerning the difficulties of meeting outside of regular class hours, problems communicating with each other, and the struggles they encountered interacted with group

members from diverse backgrounds. Further, the participants expressed how challenging it often was to coordinate their schedules to meet on a regular basis, especially for group members with jobs or who live outside of town. They also encountered obstacles working with people who exhibited work ethics different from their own (For example procrastinators versus go getters) and those who were over bearing in their role as group member. One student explained that she often assumed the role as a mediator within the group which made her feel as if she could no longer be “...*an active contributor but was only putting out the fires created by those members who had difficulties being flexible or those who procrastinated.*” The aggravation suffered when group members left their work to the last minute emerged frequently within the teacher candidates’ group work experiences and as they explained, this often resulted into a situation where “*a lot of the work was left to one student.*” The final challenge these teacher candidates struggled with was their dissatisfaction with the assessment practices employed when evaluating a group assignment. A number of students suggested that group work assessment appeared “...*unfair and inaccurate.*”

After reflecting upon my personal experiences, I came to the realization that the concerns of teacher candidates appeared valid and very similar to my own. Many PE students seemed to enjoy and value group work even though it was fraught with challenges. Following the wiki project and the data collection, I posed this question: how did the wiki experience influence the teacher candidates’ feelings about group work? In the next section, I will attempt to answer this question by outlining the experiences of the teacher candidates using the wiki as a tool to collaborate in a group project.

## How to wiki

### *Technology*

Using both journals and writing samples, teacher candidates reflected upon using the wikis to collaborate on the subject of ‘Teaching Games for Understanding’. Their reflections on using the wiki were mostly positive and related to the ease and convenience of the wiki technology. *“The assignment made me happy as I could get things done easily and fast”*, revealed one teacher candidate. Another participant echoed a similar sentiment stating, *“Although one day I was frustrated with my computer, the wiki assignment made me happy as I could get something done easily.”* Several participants commented that they found the technology and organizational parameters incorporated into the wiki to be very *“...straightforward and easy to use”* and the majority of these individuals agreed with the statement that the *“...simplicity of editing and learning to use the wiki happened primarily through trial and error without much frustration.”* This may be a result of the “WYSIWYG” word processing interface.

The “What You See Is What You Get” (WYSIWYG) window is the place where wiki users go to edit their own or someone else’s work (see Figure 10). The Oxford Dictionary defines “WYSIWYG” as the appearance of the text on-screen represented in the same form as a print out of that text. As most students have learned to use computers early in their education, using a word processor is a skill most students nowadays possess when entering universities. Wikis, such as the one used within this study use a similar word processing interface to that of Microsoft Word, which is familiar to all of the

teacher candidates. Some of the teacher candidates who recognized the ease of use and inherent value of the wiki technology thought that it might be “...*great to use in a classroom.*” These teacher candidates seemed to realize that wikis may be simple enough to use with younger participants.

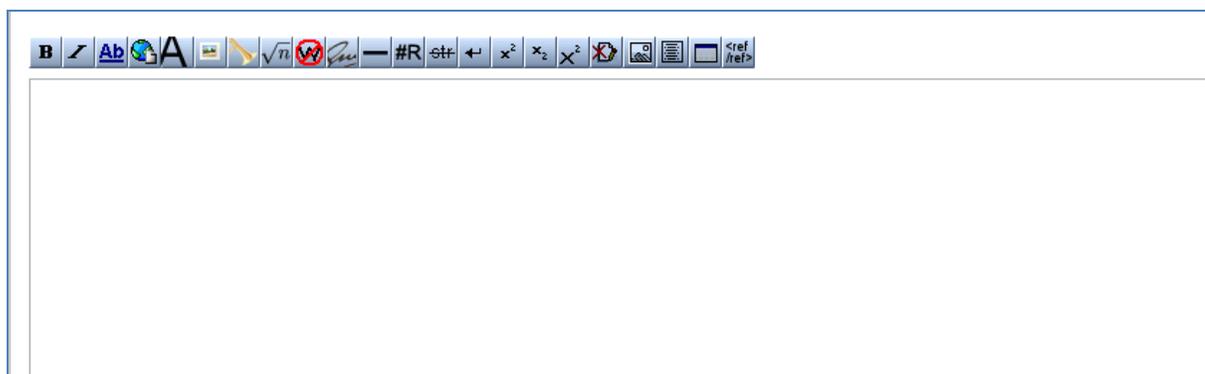


Figure 10. WYSIWYG editing window in MediaWiki

#### *Accessibility and convenience*

The teacher candidates commented that the simplicity of and its ease of use were only two reasons why they enjoyed using the wiki in this assignment. The convenience a wiki provided for busy undergraduate students was another factor. All of the teacher candidates noted how it allowed for flexible work schedules. “*You can use your own schedule, no need to coordinate times to meet,*” stated one participant. Using a wiki seemed to be “...*much easier than finding the time to meet and talk.*” These teacher candidates appreciated that anyone with a computer and a web browser can use a wiki. In today’s society, most students have computers and internet access at home. Although teachers may expect this, it is still important to check to ensure that the students have access to a computer. It is the teacher’s responsibility to arrange alternative and convenient access to a computer where required. One student within this study did not

have access to a computer and was restricted to using the computer at university, which frustrated her greatly. It affected her role as a group member as she “...*did not feel as though she was part of the group*”. An added frustration for this particular student was the fact that she lived outside of the city and her access to computers was extremely limited. Although the professor agreed to an alternate assignment for this student, this study demonstrates the need to minimize issues surrounding computer accessibility. It is crucial to inquire about each student’s ability to access a computer before the project begins and to ensure appropriate arrangements are made in advance so that the students can contribute and feel part of the group.

Those students who had access to a computer found this accessibility to be a major bonus when participating in doing group work. The work was visible and on the internet at all times, “...*you can work on it when ever you want and where ever you want...*” as stated by one of the teacher candidates. The ability to change and update the text on the wiki seemed convenient for most teacher candidates. Within the focus groups, one particular teacher candidate commented that she was working after school and often did homework very late at night. Having access to a computer and a web browser allowed her to work on the assignment when she had the time, even at “...*3 o’clock in the morning!*” According to the teacher candidates, another advantage of the wiki meant that they “...*did not have to work out their schedules to try to meet beyond class times...*” and could work “...*at your own pace and at your own time.*” Remarking upon the simplicity of working on a wiki, one teacher candidate asserted, “...*using a wiki is easy, just sign in, read, edit when needed, and add what is missing, plain and simple!*”

### *Computer skills*

During the reflective journals, I asked the teacher candidates if the wiki allowed them the opportunity to improve on their computer and writing skills. I used a small survey and requested they choose the one area that improved the most that week and elaborate on it. The areas that they had to choose from included:

- Understanding the TGfU approach
- Understanding the practical applications of TGfU approach
- Improving their writing skills
- Enhancing their computer usage skills

While I did not collect statistical data from the survey, they did provide me with an overall sense of how the teacher candidates ranked their perceived improvements. From an examination of the data, when the teacher candidates referred to an improvement to their computer usage skills, it invariably was framed within the context of using the wiki. Most teacher candidates expressed that they were “...*getting more comfortable with the wiki tools...*” but that using the wiki seemed to have no appreciable effect upon their general computer skills. One reason may be that this project only lasted 6 weeks, and was not sufficiently long enough to evaluate the effect of a wiki on the students’ computer skills. Another possibility is that the teacher candidates’ skill level using the technology far exceeded the requirement to operate the basic tools of the wiki. On the other hand, most teacher candidates did perceive the wiki to have an influence on their writing skills, their understanding of the TGfU approach and its application.

### *Writing skills*

According to many teacher candidates, a wiki may in fact improve their writing skills. They explained that although the project only lasted five weeks, several events contributed to an improvement in their writing skills. First, some teacher candidates stated that “*creating and posting text online, made them pay more attention to their spelling, grammar, and sentence structure.*” These teacher candidates acknowledged that publishing text online seemed to carry more weight than handing in assignments solely for the professor to view. This was especially true when creating the game. One teacher candidate stated that when it came time to explain and promote her game in terms of its fit within the target game category, the use of the wiki directed her to be cautious and more aware of her writing style. These students believed that by focusing their attention upon their writing, they were essentially improving their skills by “*...practicing their spelling and grammar.*”

In addition to creating or publishing text, some teacher candidates explained that the editing process caused them to think about their own writing. One teacher candidate rationalized that wikis provide a good opportunity to improve his writing through “*the amount of editing, formatting and erasing info...*” he had to do on the wiki. He also mentioned that “*the time spent on reviewing, editing and formatting...*”, helped him to “*...develop his proof reading and error detection skills.*” Finally, next to creating and editing, many teacher candidates believed that their writing improved through their “*...research and paraphrasing*” of the content material. Although some teacher candidates merely copied and pasted information into the wiki, others did paraphrase

their work and believed that the use of the wiki enhanced their writing. While these university students knew that all academic papers must include the appropriate citations when mentioning the work or ideas of other authors, it appeared that some work on the wiki was not cited appropriately. The professor is aware of this observation and will in future assignments clearly outline the rules and citation guidelines for teacher candidates to follow when referencing content.

### *Communication*

As explained earlier, a wiki only uses a few attributes to guide the editing process. The wiki interface includes the article, or wiki page, the complete history of all the work done on the wiki by the contributors, an edit tab that includes the ‘WYSIWYG’ window and a discussion tab. The discussion tab brings the group members to a work area similar to the one exhibited by the edit tab. Group members used the discussion area to communicate with each other. In this study, it appeared that not all of the teacher candidates used the discussion tab. Those who did use it found it very useful during this assignment. In fact, those who did not use the discussion area, or realized its existence too late within the project acknowledged that its use would have maximized their level of communication with the other group members and minimized many of their frustrations. This section initially highlights the positive experiences of those who used the discussion board and later examines the major hurdles experienced by the non-users as they relate to the candidates’ feeling and status as equal contributors and members of the group.

Some of the teacher candidates used the discussion board to “...*allocate work and communicate...*” with group members. Others found the discussion board useful to

“...understand the insights and thoughts of each other and work together...” in order for everyone to contribute equally. The discussion board allowed the teacher candidates to chart each other’s contributions, thoughts, and ideas regarding the assignment. In addition, it allowed the teacher candidates to “...post questions and comment on the wiki assignment.” According to some of the teacher candidates, the use of the wiki’s discussion board was valuable in the “...process of collaboration.” As expressed by one of the group members, the discussion board allowed them to collaborate, which according to him, was “...extremely vital to this assignment.” When comparing different groups, the data revealed that those groups who did collaborate on the wiki demonstrated less frustration and anxiety with the project assignment than those who did not use the discussion board.

On the other hand, those who did not use the discussion board realized later that organizing group discussions would have lowered their frustration levels greatly. “My group did not seem to know about the discussion tab,” one teacher candidate explained, “if we all posted on the discussion board, communicating would be easier”. Another teacher candidate indicated that at the end of the project, the majority of group members started to take advantage of the discussion board and realized its potential for communication. He further suggested that his group would have worked “...more efficiently if they had discovered the discussion tab earlier in the assignment.” Frustrations arose for those teacher candidates who attempted to use the discussion tab while the other members of the group did not. One teacher candidate attempted to get a discussion started but “...only one person replied.” At the time, that particular individual

did not feel as though her group was “...*working well together.*” Another participant stated that because “...*others don't read the notes,*” he was unsure as to whether the group felt that the content he created was inferior of if the group members just did not know about the existence of the discussion board. In the focus groups, the teacher candidates all agreed that if all of the participants had used the discussion board to “...*communicate their comments and concerns; it would have eased the process of collaboration.*”

When analyzing the data, I noticed that the need to discuss and communicate happened around the same time that the professor offered the second and third section of scaffolds. The scaffolds (heading provided as guidance for content creation) in this first section were very clear and straight forward and communication between teacher candidates did not frequently occur at this time. Stressing that wikis create room for collaboration, some teacher candidates were somewhat confused and expressed that there was no real collaboration at this stage. However, most of those teacher candidates also exclaimed that it was “...*amazing how everything gets done with so little communication.*” Another student shared this opinion as he proclaimed that “*We did not communicate at all and I find the ease at which it can all be done very cool.*”

In the first section, the focus of a scaffold was to create an opportunity for everyone to contribute, even if it was at a very individual level, as teacher candidates indicated. The group members were still collaborating as far as creating the content together. A wiki keeps all the content visible at all times and this first section served as a starting point or base for the next section. For example, in this study, the teacher educator

rationalized that the teacher candidates should understand or at least have a reference to the theory, history and philosophy behind TGfU if they were to understand the applications of the model within a specific game category. Each section offered a new and different type of scaffold which in the end created different experiences for the teacher candidates. These experiences took shape as I read each candidate's journal and analyzed the data for indications of the challenges and successes that emerged as time went on and the scaffolds changed. In the following discussion I will illustrate how the teacher candidates tackled the scaffolding embedded within the wiki in each section. I believe that it was important for me, as the researcher, to gain more insight into how the scaffold related to their learning about both the wiki and the TGfU approach.

#### Experiencing scaffolding through a wiki

##### *Section 1: Overview of TGfU*

The first section in the wiki provided several headings for the teacher candidates to develop an overview of the TGfU approach: history, philosophy behind the approach, the model (diagram: adapted from the original model), explanation/description of each step in the model and teaching implications. In this section, the teacher candidates researched the topic, identified the appropriate text, and completed the section by either paraphrasing or copying and pasting the text into the wiki (see Figure 9). One of the requirements of the assignment was that teacher candidates edit at least once per week. In order to contribute to the wiki in the form of an edit, it became necessary for the teacher candidates to read the material posted by their peers. From the data, it appeared that most teacher candidates perceived the word edit to simply mean the correction of

spelling and grammar. As illustrated in Figure 11, the majority of edits were focused on correcting spelling and grammar. Perhaps this occurred because the scaffold provided was straight forward and very concrete and did not call for creativity on the part of the teacher candidates.

When contributing to the scaffold ‘history of TGfU’, all four groups produced very similar entries. However, upon closer examination of the data, it became clear that the scaffold ‘history of TGfU’ was interpreted by the teacher candidates to mean origin of the TGfU approach. Three groups copied and pasted information right into the wiki, while one group paraphrased the information. Further, it became obvious from the data that one or two teacher candidates within each group created this section. The contributions from these teacher candidates were made primarily in the form of copy and paste.

Although the level of interaction within each group in this section was minimal, most teacher candidates did gain knowledge from these types of scaffolds. Various teacher candidates reflected in their journals on how they interacted with the scaffold and what they learned from completing this section. While one student explained that he was very familiar with the model and that the first section simply reminded him of what it entailed, other teacher candidates indicated that their knowledge base rose to various levels, depending on what they already knew. One student less familiar with the model stated that in order to clarify the history on the wiki, he was required to “...*find the info and understand it.*” Another student explained that through his research, he now understood why the TGfU approach was created. A female teacher candidate responded

that she was able to understand the philosophy better because she read what another person had added to her text. A fourth student explained that *“paraphrasing information helped him gain deeper understanding of the subject matter.”* The above teacher candidates all interacted in some way with the content. Even though the teacher candidates were initially taught the model in class before engaging in this assignment, they processed the content in different ways and at different speeds. The wiki allowed them to make individual decisions and choices regarding the way they interacted with the content. As illustrated above, some teacher candidates simply read the posts, while others researched and expanded upon the information provided. By adding new text to the scaffolds, they tried to gain a deeper understanding of the model.

Scaffolds such as the ‘history and philosophy of TGfU’ were concrete and, according to the teacher candidates, these scaffolds were important in the process of learning about the approach to teaching games as well as learning the basic Wiki tools. For some individuals, researching these topics allowed them to explore the concepts in more depth. One student alluded to the fact that looking at the theory helped him to understand the practical implications of the model. He explained: *“I was able to make a practical connection in terms of skills and tactics transferring between games.”*



A second teacher candidate experienced a shift in his thinking about the approach to teaching games: *“I first thought TGfU was to make skill acquisition fun but I now realize that the model is also used for helping students understand the strategies involved in playing a game.”* Another participant in the study, made a connection to his own teaching: *“My understanding of TGfU is beginning to take on a much larger aspect of interest in developing it into my own philosophy.”*

Each of these teacher candidates experienced learning differently. As the journal reflections exemplify, reading, researching, copying, pasting, and paraphrasing information pertaining to concrete scaffolds challenged teacher candidates in a variety of ways. The value of providing teacher candidates with clear and concrete scaffolds was expressed clearly by one student in the following statement: *“Researching and understanding the theory behind TGfU has given a background and purpose to this strategy, which greatly benefited me in terms of how well it fits into a quality PE program.”* These concrete scaffolds created a foundation that allowed the teacher candidates to focus upon the general elements necessary for comprehension, before moving on to specific areas of the TGfU approach.

### *Section 2: Specific Game Category / Teaching Implications*

Once the teacher candidates learned the framework or background of the concept they were trying to understand, scaffolds that required teacher candidates to make connections between texts were imported. The scaffolds in this section (see Figure 9) were also clearly defined but the content that the teacher candidates were to create was more complex and detailed. The teacher candidates were required to build links between

the concepts from the first section and the research on the second section. For example, one student explained: *“by researching for the overview of target games, I came across some good sites which were application focused. I had that and came up with my own thoughts on the overview.”* This illustrated that the content was not found explicitly in the research, but rather the research created enough information to form the necessary connections for the teacher candidates to create the new content.

Scaffolds, like the nature of the specific game categories connected to the TGfU approach, were less concrete and provided more opportunity for creative interpretation. At this level, a shift occurred from copy and paste to reading, making connections and writing. One student reflected upon this shift in interaction while using the wiki: *“As the assignment requires more in-depth information, I learn more about the model and do more research.”* Slowly, through guided discovery, the teacher candidates found more in-depth and detailed information on how to teach specific games according to the TGfU model.

By asking the teacher candidates to explain the specific nature of a game category, the content became more focused. Each dimension should build upon the next and as another level was revealed, teacher candidates began to understand the model more clearly: *“the more we put on our wiki, the more I see that it all fits together nicely.”* Another student affirmed that through the second scaffold, she started to *“...understand the model and how it transfers to the specific category.”* As teacher candidates made connections and in order to understand the model more clearly, they also began to notice how this applied to them, as future teachers. One teacher candidate explained: *“I found*

*that getting into the framework, breaking down the skills and activities and looking at how students go through each stage of the game very beneficial to my own teaching.”*

Once the participants understood the model and its application to teaching games, they were ready to apply this knowledge to developing their own games.

### *Section 3: Game Progressions*

The scaffolds in the third section (see Figure 9) were designed to be more open-ended and application based. Even though this encouraged teacher candidates to be more creative in the content they produced, it was apparent from the data that some of the teacher candidates had a difficult time with the scaffolds that were designed to be interpretive by nature. One female student explained the difficulties creating content in the third section by stating: *“I had to think how to start so working as a group helped.”* She suggested that while she may not have known how to start, others, who had prior knowledge of the TGfU approach, might have been more comfortable with the task and thus were the first to contribute to the wiki. This teacher candidate may not have had the prior knowledge to create new content but was ready to build upon content already created by her peers. In the following journal excerpt, she stated, *“this past week was challenging so it helped a lot to have a group set up some info which I could then build on.”* This illustrated that when content was added, it served the purpose of a new scaffold, just as important as the initial heading or original scaffold provided by the teacher. The student-created content then became the new scaffold.

Using more open ended scaffolds allowed for many teacher candidates to see the supportive role a wiki played in creating games. One student explained: *“We continually*

*edit and add to the wiki, contributing to the greater knowledge and understanding of the topic. One person starts off; everyone gets ideas and adds to it to create a great project.*” Another student provided this insight: *“I hope others can take what I have written and keep on improving it.”* According to one student, the biggest success of the project was the ability to work well together without much verbal communication. Their group interacted by creating new games or building on games already on the wiki. This student reflected on the simple and straightforward nature of using wikis to develop new knowledge. As teacher candidates can choose to read, create or build on content, they are not put into a potentially humiliating situation if they have a difficult time inventing a game. The student continued to explain that *“wikis create a unique, new dynamic of group work where you learn the most from other people’s ideas.”* Developing an understanding of the TGfU approach through the creation of these games in a collaborative fashion brought teacher candidates to the creation of a more advanced product. One student claimed that *“the major advantage of a wiki is when you read what others have added, it helps you come up with new ideas, ideas you would never come to if you were to design a game on your own, it is in fact a superior product.”* Even though the wiki provided an environment for the teacher candidates to build on each other’s ideas, one teacher candidate cautioned: *“in order to provide assurance of ongoing success, there must be scaffolding.”* Clearly, this teacher candidate realized the impact of wikis and its potential for continued, collaborative learning.

Even though many of the teacher candidates indicated that the work was easily completed with little need for communication, they also realized that an increase in

communication between group members could have made a positive impact on the process of collaboration. As illustrated earlier in this Chapter, the teacher candidates did not feel the need to communicate as much during the first sections. The data also revealed that in the third section, the teacher candidates began to wonder about the use of wikis for group work. One quote was particularly intriguing to me: *“Wikis take away from the positive aspects of group work. There is little teamwork, communication and chance to build relationships. Wiki is not great for group work.”* This emerging phenomenon captivated my attention and I began to investigate the reasons why these teacher candidates enjoyed the wiki at first, but later began to doubt its purpose. The next section will examine, in greater depth, the experiences of the teacher candidates as they completed the third section.

### Completing section 3

A shift occurred in the teacher candidates’ perceptions regarding the usefulness of the wiki between sections two and three. Up to the end of section 2 two, the journals of teacher candidates revealed shared reflections of positive experiences. On the other hand, the subsequent journals uncovered a very different image. In order to capture their experiences, the following quotes are purposefully listed in an attempt to depict the intent of their concerns.

*“The first 2 topics were very easy as everyone knew what to do but in topic 3 there is confusion on what was expected. People just started posting on their own and it did not really fit with the task in hand, just so they could meet the 1 creation 1 edit requirement. This is very frustrating.”*

*“I’m not sure what we’re supposed to do for the last part.”*

*“Everyone is confused on the 3<sup>rd</sup> topic, everyone has different interpretations”*

*“Very frustrating and difficult to communicate, no idea what to do on topic 3 so we all post random things to meet quorum this week.”*

*“Challenge this week was that we do not fully understand what the 3<sup>rd</sup> section meant. We each have our own interpretation and although similar, each person has its own style.”*

*“I don’t think anyone understands what we’re supposed to do. Even meeting face to face did not clarify things on section 3.”*

From reading these reflections, it was obvious that many teacher candidates were confused and frustrated. There may be many reasons why these candidates expressed feelings of confusing, frustration and inadequacy inside their journals. One reason for their apparent inability to use the discussion board may have simply been the result of not knowing about its existence. As previously noted, using the discussion board could have increased the level of communication and perhaps minimized these issues. Further, these expressed frustrations could be related to the type of scaffolds introduced. In order to encourage creativity and building upon each others’ ideas, the third section called for more open- ended scaffolds. The transition between the scaffolds from the second section and the scaffolds within the third section may have been too quick or the scaffold may have been too open-ended in its meaning. Some teacher candidates explained that they

*“...did not know what was expected of them as they could not understand what the task was.”* They also explained that various group members had *“...multiple interpretations on what the scaffolds actually meant”* and even with face to face conversations, the teacher candidates stated that they were still unable to comprehend the scaffolds within the third section.

Both the post-writing samples and the focus group interviews revealed that the confusion of the third section could have been avoided if *“...clear instructions...”* were provided and if the *“...organization of the scaffolds within the section...”* were to be improved. The teacher candidates acknowledged that they were *“...unsure about the criteria of the assignment”* and affirmed that *“everyone should know what to do and what is expected.”* This demonstrates that even though a scaffold can be open-ended in its purpose, a detailed explanation about what was expected should be provided. The way in which a scaffold is to be organized should also be self-explanatory. Creating a table for students to complete that illustrated the progression of games may have eased the process of understanding the task at hand. When discussing their frustrations in the focus groups, the teacher candidates agreed that *“wikis, when organized and clearly explained can enhance collaboration and form more sophisticated web pages.”* The teacher candidates had concrete suggestions that would impact on the success of the wiki. These were mainly due to the fact that this is *“...the first time a wiki has been used to do a group project.”* Upon reflecting about becoming a future teacher, a teacher candidate explained that *“there are always going to be things us teachers will have to tweak after trying out something for the first time; the second time around should create a lot more success for*

*the students.*” This clearly illustrates that although the teacher candidates had some difficulties, these issues were not due to the wiki itself but mainly to the organization and structure of the assignment.

When this discussion arose during the focus group interviews, the participants expressed their concern with the organization of the assignment not only from their own experiences, but also from a teacher’s perspective. At this point, the participants began to articulate what could be done to create more success for the wiki participants. In the next section I outlined both the suggestions the teacher candidates developed but also the issues they thought would be resolved if these suggestions were implemented.

### Suggestions

During the focus group interviews, the shift in thought occurred from discussing their own experiences to exploring innovative ideas on how a wiki could be used by a teacher in a classroom. This transformation was not surprising given the context and I appreciated their contributions. The participants were about to embark on their teaching career and it is to be expected that the development of teaching strategies would be on their mind and eventually surface. While reflecting upon how wikis could be used to teach certain concepts, the teacher candidates expressed two overarching suggestions and explained their reasoning behind them.

*Suggestion 1: Give each student specific roles and responsibilities.*

The teacher candidates believed that adding text to the wiki seemed at time chaotic. They explained that sometimes they would add text but that the weekly limit of 100 words would inhibit their creation. There seemed to be some confusion among the

groups related to the word requirement for each section. While some groups thought these requirements established a maximum number of words, other groups interpreted the requirements as a minimum. They explained that in stead of appointing a number of words per week, assigning *“each student a role”* may engage students into contributing to the wiki. Even though they did not elaborate on what type of role each student would receive, the teacher candidates did mention that *“assigning roles and giving responsibilities to students would allow them to contribute more equally.”* They explained that within their wiki assignment, they did not always feel as if they were doing their *“...fair share of contributing as it was difficult to know if they were doing their fair share of the work.”* Additionally, not knowing what other people were doing made some teacher candidates feel *“...lost and worried that they were not contributing enough.”* Another reason why teacher candidates said that giving students roles was important was that at times, they *“...struggled to find new things to add...”* and would as a result *“...just add something for the sake of adding just so they could meet their weekly quorum (sic.)”*

As indicated by most teacher candidates, the greatest disadvantage the restrictions had was that it created *“...difficulties for all group members to contribute equally.”* Although most teacher candidates did not see the value of weekly restrictions, one teacher candidate did express that *“putting restrictions on weekly progress does ensure that students are continually progressing through the development of the wiki but it also limits what makes a wiki useful.”* This teacher candidate seemed to have a good understanding of what a wiki can do in terms of the never ending nature of building on

each others' ideas and that restrictions may inhibit this inherent support to learning. The experiences the teacher candidates shared during the interviews lend support to providing teacher candidates with specific roles and responsibilities in order to ensure the creation of a successful wiki.

The teacher candidates also reflected upon the fact that they were somewhat *"...confined to their area and did not get a whole picture of what TGfU was unless they read the other wiki pages."* Most of them stated that they did not have the time to read over the other wiki pages and as reading these pages was not a requirement, they chose not to read them. However, as the teacher candidates did propose providing participants with roles which would allow them to read, edit, and enhance their learning across all game categories and would help provide the teacher candidates with *"...a broader sense of what TGfU is all about and how the approach applies to all game categories."* Finally, the teacher educators also suggested that providing specific roles and responsibilities to teacher candidates would provide the professor with a better opportunity to assess the teacher candidates' work more *"...fairly and accurately"*.

*Suggestion 2: Organize more opportunities to communicate*

Teacher candidates also suggested that if students were provided with an opportunity to *"...discuss the progress of the wiki during organized face to face meetings during class time..."*, it may assist in the development of the wiki. They believed that face to face meetings would provide *"...support in the initial planning of the wiki..."*, as well as *"...in the organization of the wiki."* Teacher candidates found it at times *"...difficult to express ideas on the internet,"* and face to face meetings would ease

communication. Another way of communicating that some teacher candidates explored was the ability to chat on the wiki. One teacher candidate gave a few reasons why chatting online would enhance communication and collaboration on the wiki:

*“Allowing us to chat on the wiki would make communication and collaboration easier because we can ask questions regarding the content we want to post and we can discuss whether or not our ideas are relevant and fit under the right section.”*

In addition, teacher candidates expressed the need to ask questions related to the content in order to gain deeper understanding as well as to ask for clarification before you edit someone’s work. *“Some students may be timid to edit someone else’s work”* and by asking for clarification or even permission, teacher candidates expressed that they *“...may have been more comfortable editing text, if they would have had more direct contact with the person who created the content in the first place.”*

Both suggestions clearly show that teacher candidates valued the wiki as an instructional tool in order to gain deeper understanding of the content at hand. The findings presented within this thesis afforded an opportunity to explore the nature of a wiki used within a group project with teacher candidates. In summary, the findings presented in chapter four clearly indicate that the teacher candidates enjoyed the convenience of using a wiki when developing game progressions and consequently gained deeper understanding regarding the TGfU approach. The findings also indicated that learning on a wiki can be enhanced by assigning roles and responsibilities to each teacher candidate and providing more opportunities to communicate with each other. In

the next Chapter, I will discuss the theoretical, research and practical implications of the findings.

## CHAPTER FIVE

### Discussion

This study examined the role of wikis to gain deeper understanding of the TGfU approach to teaching games. The TGfU approach is a prominent part of the Manitoba PE curriculum, and encourages teachers to teach games using a student-centred method. It follows that the TGfU approach to teaching games should be an integral component of the Physical Education Teacher Education programs in Manitoba. As discussed earlier in the first chapter, in order for teacher candidates to teach games effectively using the TGfU approach, they must gain the content knowledge centered around the skills and tactics of the four game categories (invasion, target, net/wall, striking/fielding) (Chandler, 1996; Thorpe et al., 1986). The rationale behind this study was based upon the assumption that the wiki created by teacher candidates would have the potential of deepening their understanding of the TGfU approach, as well as broadening the knowledge of the skills and tactics involved in games. In addition, the scholarly research claims that teacher educators lack the time to teach instructional models such as the TGfU approach in class (Howarth, 2005). Therefore, this study explored whether the wiki could provide for additional time to discover games content and develop a richer understanding of teaching games.

The theoretical framework implemented in this study follows the principles of constructivism. According to the constructivist pedagogy, learners should be involved in social interactions and content and skills acquired should be based upon the existing knowledge of the learner. Further, teachers are meant to be facilitators, to encourage

different perspectives and instill independent learning through appropriate teaching methods (Doolittle, 2000). It was anticipated that wikis would provide several unique opportunities for enhancing the constructivist learning environment. Social constructivists point out that the interactions created between students and teachers and among students are important and may enrich learning. Palloff and Pratt (1999) state that “the most powerful experiences are those in which the interaction occurs throughout the group instead of between one participant and the facilitator” (p.19). The findings of this study demonstrate that wikis are capable of providing a learning environment in which a variety of interactions can evolve and collaborative efforts enriched. However, the open and flexible nature of the wiki also created challenges for the teacher candidates. I discuss both the enabling and challenging facets associated with the use of wikis in the context of the interactions in which they occurred. As the teacher candidates explored the wiki, they interacted with the wiki itself, the content, and their peers. In addition, I examine the teacher educator’s level of interaction and involvement in the process over the course of the assignment.

### *Interacting with the wiki*

Through their weekly journal entries, the teacher candidates outlined the more constructive and challenging experiences each encountered while using the wiki for their group project. As the findings alluded to, the teacher candidates all came into the project with a different set of experiences and expectations. The participants, with few exceptions, found the use of the wiki uncomplicated and straight forward. As they proceed with their assignment, several positive reactions surfaced as they explored the

content with ease. The wiki seemed to be a platform where the creation of text occurred with a minimal level of experience and technological expertise. The “WYSIWYG” editing tool contributed to the ease at which teacher candidates were able to work with the content. Instead of using the more complicated HTML codes which most websites use, the content displayed during editing, using the “WYSIWYG” tool, appeared very similar to the content viewed within the article. Analogous to the research on wikis, the use of simplified text is essential to using wikis in education as new users learn only a few formatting tasks and these are very similar to the ones used in Microsoft Word (Dunn, 2006; Lamb, 2004; Leuf & Cunningham, 2001).

The ease with which the teacher candidates interacted with the content by creating, reading, researching, and editing text emerged as a major advantage to the use of the wiki during the collaborative group project. A secondary benefit was the convenience the wiki afforded. The wiki was always available to those with a computer and web browser and the text was always visible so that the teacher candidates could work on their assignment whenever they desired. As a result, anyone could edit, contribute, and enhance the work of the group. The participants affirmed that the wiki provided them with a new, dynamic, two-dimensional instrument for combining individual contributions with group collaborative contributions. To ensure group interaction and collaboration, the members of some groups used the discussion (tab) board to communicate with each other. The teacher candidates learned from each other and expanded on each other’s ideas as a group. They enjoyed learning from a variety of people as everyone brought their own experiences and knowledge to the project.

A common application of wikis within education and supported within the data from this study was the reinforcement of writing instruction (Doolittle, 2000; Evans, 2006; Mader, 2006). The teacher candidates expressed that the wiki allowed them to focus on their writing style and sentence structure through editing, paraphrasing, and publishing content. According to Lamb (2004), the “teachingwiki.org” website (2008), wikis can enhance the teaching of writing skills in a number of ways:

- wikis stimulate writing ('fun' and 'wiki' are often associated);
- wikis provide a low-cost but effective communication and collaboration tool (with an emphasis on text rather than software);
- wikis promote the close reading, revision, and tracking of preliminary work;
- wikis discourage 'product oriented writing' while facilitating 'writing as a process';
- wikis ease students into writing for a wider audience.

Even though this project was implemented over a short, six-week period, the data clearly supports the research; the wiki positively affected the perceived literacy skills of the participants.

The teacher candidates also experienced a number of challenges while working with the wiki. The primary impediment occurred upon receiving the final section of open-ended scaffolds intended to encourage the creation of original games. The teacher candidates became frustrated at this time in the assignment, as clear expectations were not offered. Those participants who struggled with what the open ended scaffolds were requiring from them, experienced disorientation and they became uncertain as to how to

proceed. As soon as the teacher candidates were to become more creative, they began to look to each other for answers and issues such as locating the discussion tab amplified their frustrations. Many of the participants failed to take advantage of the discussion area to promote effective communication links among members of their group. A general misinterpretation of the scaffolds complicated matters further, inhibiting the progression of the assignment. These findings showed that a wiki may enhance collaborative initiatives but are not necessarily inherently collaborative. Umar and Alsharabi (2007) argue that it is because we are not accustomed to collaborative work that working with wikis is strange. They encourage the use of wikis when acquiring knowledge because they claim that wikis are a great way to learn to collaborate. This study affirmed that collaboration is a process that students need to acquire, especially when creating projects using a wiki. Throughout this study, the data illustrated that the participants interacted with the content at different levels starting with individual work at times and later moving towards work of a collaborative nature. While some were frustrated with the level of collaboration on the third section, most teacher candidates did articulate that throughout the assignment, they were able to contribute, edit and enhance content on the wiki page. The scaffolds provided by the teacher seemed to facilitate this process.

#### *Interacting with the content*

According to Bonk and Reynolds (1997), it is not the technology that influences the quality of learning but the instructional strategy used to enable learners to link new information to old, use meta-cognitive abilities, and acquire meaningful knowledge. This study looked at how scaffolding on a wiki can enhance deeper understanding of content

material. The literature has explored the use of scaffolding as part of online collaborative projects (Hogan & Pressley, 1997; Leuf & Cunningham, 2001; Littleton & Hakkinen, 1999) and while working in groups (Cohen, 1994; Vygotsky, 1978; Webb et al., 1995). This study extended the literature on scaffolding, focusing specifically upon wikis and the use of scaffolding to create greater content knowledge. It appeared that using a wiki for a collaborative project such as this one, is a learning process of its own. Murphy and Cifuentes (2001) argue that because the learning is controlled by the learner, the level of interaction with the content guiding the construction of knowledge, depends upon the online instruction as facilitated and guided by the teacher.

Teaching students how to scaffold seemed vital to the success of this project. The findings revealed that systematic, apparently closed ended scaffolds became open-ended scaffolds, which encouraged the teacher candidates to create new and more sophisticated ideas and form meaningful connections between, within and about the content. As teacher candidates began to build on their peers' knowledge, they began to think critically and reflect upon the content in order to generate a more refined product. Holton and Clarke (Holton & Clarke, 2006) confirm that "the analogy with construction of knowledge is that scaffolding allows learners to reach places that they would otherwise be unable to reach" (p.129). The process of moving from teacher directed and closed-ended scaffolds to student-centred and open-ended scaffolds can be viewed as an important teaching strategy when teacher candidates are learning to use wikis for collaborative projects. The findings illustrated that teacher candidates can learn to be

collaborative on a wiki through scaffolding and that an emergent system of scaffolds can assist this process.

Each section within this emergent system of scaffolds provided the teacher candidates with less support than the previous one allowing them to become more independent and interdependent learners. Vygotsky's notion (1978) of the zone of proximal development (ZPD) has often been explained as the area between what a student can do with instruction and what can be accomplished independently (Harris & Pressley, 1990). Wikis are meant to be used by a group of people, to encourage collaboration. However, collaboration on a wiki can quite possibly be a very intimidating experience for some. Factors such as comfort level using technology, editing another's work, and prior knowledge or experience may inhibit this process (Mader, 2008). Learning to collaborate on a wiki is a novel experience for most teacher candidates and requires a gradual introduction to the skill so that they can move forward from a dependent wiki user to an independent and interdependent wiki learner. (See Figure 12)

The teacher candidates were first provided with a concrete, one dimensional scaffold. These scaffolds incorporated titles, words, and headings that were very familiar to the candidates. The concrete nature of the scaffolds allowed the participants to recognize and research the topic words with ease. These scaffolds encouraged the teacher candidates to locate and match the text to the concepts effortlessly and with success. At this stage, the teacher candidates' involvement was at an individual level and did not require further interaction of communication with their peers or instructor. During the second section, teacher candidates were to uncover some of the content on their own. At

this stage, they began to build links between the content and the research, which encouraged them to contemplate the applications of the TGfU approach and permitted them to create new knowledge. As the scaffolds became more open-ended, the wiki technology began to prove its strength as a collaborative tool. In the third section, the technology allowed teacher candidates to create games collectively. Even though the teacher educator still provided specific scaffolds, the teacher candidates had to be creative and original in their game development. A shift occurred from direct instruction (closed) and guided discovery, to a 'student centred' approach that provided the participants with greater control and choice (open) over what they contributed to the wiki while inventing and creating their games.

With the introduction of scaffolds open to greater interpretation, the members of each group found it necessary to rely upon each other more often in order to understand, create and edit text. When peers take on the constructive role of providing scaffolds or support to each other, Holton and Clarke (2006) refer to this as 'reciprocal scaffolding'. When group members began to rely on each other for support, some groups utilized the discussion area to support their collaborative efforts while others did not. The result was the successful completion of the project by some groups, while the remainder struggled with the final section of the assignment. The organization of this section was either poorly designed or the scaffolds were far too open to interpretation, inhibiting the process.



Figure 12. Emergent Scaffolding Design

Holton and Clarke (2006) explain that the teacher has the responsibility to know when to assist the learner in their construction of more knowledge, just as a builder knows how to construct the next scaffold. They state two purposes of scaffolding. First, a scaffold can be used to move a student forward to gain knowledge and second, scaffolds are used to encourage independent learning (Holton & Clarke, 2006). It is possible that some teacher candidates were not ready for the open-ended nature of these scaffolds. As a result, the pre-set scaffolds enabled some teacher candidates to understand how to complete the wiki assignment. On the other hand, others were uncertain as to the assignment's expectations and what and how to contribute. This affected confusion and frustration amongst the group members and resulted in the creation of random games rather than game progressions.

The findings demonstrate that not all of the teacher candidates knew how to collaborate, particularly when required to utilize a wiki. However, a wiki can facilitate the process if an instructional design put forward by the instructor teaches collaboration gradually (Murphy & Cifuentes, 2001). The challenges experienced by the participants of this study suggest, that when designing instructional scaffolds, both the participants' ability to learn new skills and the contents level of complexities require careful consideration. The facilitator could not alter the scaffolds to meet the needs of the candidates because the interaction and communication between them proved minimal at best. Although the instructional design enhanced the construction of knowledge, for the most part, the guidance of the teacher/facilitator was not in place; consequently, the success of the system was not fully realized. The assignment's structure (or scaffolding)

and the degree of guidance offered proved crucial to the collaborative learning process and the knowledge acquisition of the teacher candidates.

### *Teacher Interaction*

The delimitation of the study to minimize the involvement of the professor during the wiki assignment inhibited the learning process. Despite this, none of the teacher candidates addressed this point in their communications. Instead, they clearly acknowledge the need for greater structure, organization, and the assignment of specific roles and responsibilities for each member of the group. To assist in accommodating the teacher new to the online learning environment, Sims, Dobbs, and Hand (2002) suggest that "the overall approach to the content, how it should be presented or accessed and the relationship between the teacher and learner in that process" (p. 138) should be reevaluated prior to beginning an online project. Due to the delimitations set out for this study (i.e., that the professor would only respond to queries when asked by students), the professor was not free to exploit the online environment to its maximum, contributing to the frustrations experienced by some of the teacher candidates.

During the focus groups, the teacher candidates suggested that an assignment of specific roles and responsibilities to each member of the collaborative group would have helped alleviate many of the frustrations they had experienced. These findings support the notion that collaboration needs to be taught and is not inherent for all students. According to the reflective thoughts expressed by the pre-writing samples of the teacher candidates, group work involves a re-distribution of the assigned workload amongst the group members, the completion of each individual's contribution, the compilation of the parts to

form a whole, and the submission of a final product. Recognizing that the participants were already comfortable completing group work, assigning specific roles and responsibilities to each group member may have enhanced their comfort level using the wiki.

This study does not suggest an allotment of different elements or pages of the wiki assignment to different group members, as that would eliminate the benefits gained through the process of scaffolding. The candidates would simply be compiling separate pieces to a puzzle rather than building upon each others thoughts and ideas. The assignment of specific roles has been suggested as a possible mechanism for improving the success of the wiki (Dunn, 2006; Mader, 2008). For this TGfU wiki, one suggestion might be to provide each teacher candidate with a different role in each section of the wiki assignment (i.e. each game category). For example, a participant may be the creator (create new content) of one section, invasion games, while function as the editor (edit existing content) of section two, target games, and the enhancer (building on to existing content) in section three, striking and fielding games. The teacher candidates would be able to choose where they wish to complete each role and bonus marks could be allocated to those individuals who contribute beyond their assigned sections.

Notari (2006) suggests that the teacher or leader of the course should be prepared to function as a facilitator and be ready to provide their students with constructive input or to propose a specific activity or solution as required throughout the learning process. Thus, the facilitator not only provides the students with a scaffold script or outline, but also is required to carry out many other tasks that will contribute to the success of the

assignment. In her article “How to Use a Wiki in Education: Wiki based Effective Constructive Learning”, Notari (2006) summarizes points from Dillenbourg’s book on collaborative learning that suggests that scaffolds scripts should include:

- The tasks that students have to perform
- The composition of the group
- The way the task is distributed within and among groups
- The mode of interaction
- The timing of the sections (Dillenbourg, 1999, pp. 1-19, as cited in Notari)

Notari (2006) explains that through the use of a scaffold script, the instructor is responsible to educate the students on how to effectively use a wiki. They must learn how to communicate, edit, and comment upon the input of other members. Each student must learn how to react to edits made on the content they created and learn to build links between their contributions and the content of others. Designing a scaffold script to enhance collaboration within a group may seem like a laborious task but, as indicated by the data, organization seemed to be the missing element in this assignment and planning for success may alleviate many of the frustrations shared by the participants.

To facilitate a supportive environment, a teacher’s blog put on the wiki may provide feedback to the students when needed. Blogs are a technology that allows a sequence of entries, just as a journal does (Richardson, 2006). The content is controlled by the author and readers may respond to the blog if they wish (Hsu, 2007). A blog can be used in different ways to encourage expression, reflection, and online relationships (Glogoff, 2005). A teacher’s blog would offer a teacher educator the ability to provide the

teacher candidates with both guidance and constructive feedback, over the entire time span of the wiki project. When a teacher candidate poses a question, the professor can provide an appropriate response inside a blog and all of the participants can view this. This creates consistency and continuity in the flow and organization of the project.

### *Interacting with peers*

Research shows that a wiki is a tool to encourage collaboration and communication among the members of the wiki community (Berkman, 2004; Dunn, 2006; Engstrom & Jewett, 2005; Leuf & Cunningham, 2001; Long, 2006; Umar & Alsharabi, 2007; Wagner, 2004). As discussed earlier within this chapter, in order to collaborate successfully on a wiki, a structure of scaffolds and continued guidance by the facilitator must be in place. The findings from this study clearly indicated that wikis, when used for a group project, are not inherently collaborative yet can facilitate collaboration if instructional supports are in place. In addition, the findings also demonstrated that the teacher candidates had a difficult time communicating using the wiki. They frequently stated that communication between group members was vital to the success of the project. Collaboration is often defined as the process of interaction amongst people (Davies, 2004). However, the term collaboration varies in its interpretations. It can be synchronous, where people communicate in person or within the same time; or it can be asynchronous, like on a wiki, where people who communicate with each other do not need to be present at the same time.

On the wiki, discussions occurred on the discussion page. The findings from this study and from other research (Cho et al., 2007; Schellens & Valcke, 2006) showed that

the discussion tab can be a useful tool to encourage asynchronous communication. However, the findings also indicated that the participants had difficulty communicating with each other when using the discussion area exclusively. They suggested that face-to-face meetings interspersed between chat opportunities on the wiki's discussion page would accommodate communication between members of the group more effectively. It is important to note that not all online discussion forums are designed the same. A discussion forum can be held in chronological or reverse chronological thread mode or document mode. When using the chronological mode, the discussion page is ordered according to the time and date of the posts with the oldest one appearing first while in reverse chronological mode, the newest posts appear first.

On the wiki used for this study (MediaWiki), the discussion area has the possibility to do both. When clicking on the + sign, participants can use the thread mode while when clicking on the 'edit' tab, the participants would be editing the content just as in the normal document. Even though the edit mode allowed the participants to edit each other's work, it did not seem to provide a good place to pose questions and receive answers as does the chronological thread mode. It appeared that most groups used the edit mode rather than the thread mode to communicate and not being aware of the two types of discussion modes could have contributed to the participants' frustrations. Some teacher candidates expressed their disappointment when comments were erased from the discussion area. These candidates believed that the discussion area should have been a place where one could post questions and answers and still have been able to return to them at any given time. By reinstating the history of the page, the teacher candidates

could have reviewed the removed posts but this might prove inconvenient. The findings suggest that it is important to determine which discussion modes would be best suited the students participating and provide some training to familiarize the participants with the process of leaving comments and responding to questions.

While some groups used the discussion area and others did not, many teacher candidates explained the need for synchronous communication opportunities. Researchers are starting to explore different ways of incorporating synchronous collaboration systems inside a wiki (Ohshima, Wallace, Yamamiya, & Raab, 2007). Ohshima et al. used a 'WikiPhone' to permit multiple users to communicate with each other using the wiki. Although this system still requires refinement, it will be interesting to observe its development (Ohshima et al., 2007).

The findings suggested that teacher candidates need to communicate with each other in order to create a sense of community. Even though linked to each other via the internet, they felt disconnected because of their inability to effectively communicate with other members of their group. It was important to the teacher candidates that a web-based classroom community be established facilitate their collaborative efforts. Organizing time to meet within the regular class hours might promote that sense of community. Scheduling the first five minutes of class time to discuss the progress of the wiki may be sufficient. Another way to enhance community building was explained in "Using wikis in Education", a book edited by Stewart Mader (2006). While providing many examples of the use of wikis in education, Sandra Chrystal (one of the teachers referred to in Mader's book) explained that cultivating the interaction among her students was created by

establishing personal wiki pages for each student. She stated that installing “a personal wiki page for each student fostered more writing and student engagement than she’d anticipated” (p. 73). On his website, [Wikipatterns.com](http://Wikipatterns.com), Stewart Mader (2007), explains that a personal webpage can encourage group members to practice basic wiki tools and can assist in creating positive relationships and community building.

The above discussion illustrated the various interactions this project offered, its positive implications as well as the challenges they posed in relation to the current literature on wikis. To summarize, the discussion explained that a wiki can minimize the frustrations regarding traditional group work, facilitate collaboration among group members, encourage knowledge construction, improve writing skills and broaden the understanding of concepts learned in class by extending the learning environment. The study also showed how the teacher candidates interacted with the content to gain a deeper understanding of the TGfU approach through an emergent design of scaffolds. In order to encourage knowledge acquisition, the instructional guidance provided by the facilitator was a crucial component of the scaffolding design. Finally, important to a collaborative group project, such as the one presented in this study, was the necessity to provide the group members with a variety of communication opportunities both at the asynchronous level, through the wiki discussion board, or at the synchronous level, by offering regularly scheduled face-to-face meetings or instant messaging on the wiki.

## Conclusion

As students become more techno-savvy, a tool such as a wiki can greatly enhance students' learning by teaching them how to collaborate effectively on projects online. Teaching students how to create a group project through the scaffolding of knowledge is vital to the success of using wikis in schools. This study has demonstrated that the wiki can be a valuable instructional tool for group learning. In this study, the various built-in forms of learning supports, such as "public availability, democratic accessibility, group authoring and editing options and group communication," (Reo, 2006, p. 37) provided an opportunity for scaffolding, facilitating a deeper understanding of the TGfU approach, constructing and deconstructing games knowledge, and promoting inquiry into the pedagogy of games. Just as students learn how to use the internet, instructional designs for teaching effective collaboration should be in place. Although all of these learning supports were in position, it is the teacher's responsibility to supplement the wiki's intrinsic learning potential with clear organization, guidance and various learning scaffolds. Unique to this investigation was the introduction of an emergent scaffolding design to enhance the success of collaboration using a wiki. This study confirms that wikis may facilitate collaboration and group communication. In addition, the teacher candidates suggested that assigning teacher candidates with specific roles and responsibilities and creating more opportunity for communication on the wiki and within the regular classroom may enhance their overall learning when using a wiki.

## CHAPTER SIX

### A reflective evaluation of the research

When a professor first approached me to investigate the use of wikis as an instructional tool for teacher candidates, I embraced the opportunity and allocated the necessary time to enhance my knowledge base around wikis, TGfU and teacher education. That meeting initiated a journey that has truly been amazing and worthwhile. I learned valuable skills within my Masters' program and in producing this text; I realized that this accumulating activity was one of the highlights of this voyage. After interpreting the experiences and perceptions of the teacher candidates, I attempted to share their voices through this thesis. It has not always been an easy ride. As a graduate student, I wanted to say it all, so to say the least, I had difficulties conveying the message without citing all the perceptions of the teacher candidates. Assisting me in this process were the research questions I kept in mind while writing up this analysis. I actually had these questions posted close by to keep me focused.

In order to evaluate whether or not the data analysis is complete, I have decided to use some of the six questions Ellis (1998) suggests for evaluating qualitative research findings to formulate my own reflections regarding the study. These questions allowed me to revisit my research questions and explore the effects the research had on the participants, the related literature, and myself, the researcher. The question central to this study was: *What are the perceptions of physical education teacher candidates regarding the usefulness of wikis as an instructional tool to enhance learning through a collaborative group project?* In order to guide the research, I created five sub questions.

With regard to the first sub question, I inquired about the experiences of PE teacher candidates using a wiki in a group project. For the most part, it seemed that the teacher candidates enjoyed using the wiki within this TGfU assignment. The wiki seemed to lessen the frustrations they experienced during traditional group work. With the exception of one student, the convenience and accessibility the wiki provided was claimed as a major advantage when doing group work. Another positive attribute to using wikis was the simplicity of the wiki technology when creating, editing, formatting and enhancing text on the wiki. The WYSIWYG editing tool was one wiki function that appeared to contribute to the ease in which content could be created. For those teacher candidates who used it, the discussion board had a positive impact on their level of collaboration. To enhance their engagement with the wiki even further, the participants suggested combining asynchronous discussions, such as the discussion board with synchronous discussion opportunities such as instant messaging. For students to become comfortable using the wiki tools, research suggests that each student should create their own wiki page on the wiki in order to practice writing, editing and formatting content (Mader, 2006).

The second sub question attempted to discover what influence the wiki had on the PE teacher candidates' understanding of the TGfU approach. The findings showed that wikis facilitated collaboration on specific content knowledge related to the TGfU approach. The teacher candidates expressed several ways in which the wiki assisted them in gaining deeper understanding of the TGfU model as well as understanding the applications to teaching games. First, the wiki provided them with a platform where all

their work was visible at all times. This made it possible to view all the information that was important for teacher candidates to learn in one location. In addition, the wiki created a place where knowledge was constructed and deconstructed according to the scaffold script the teacher educator provided. Even though the teacher candidates explored the topic of TGfU in their regular class hours, the wiki provided an opportunity for them to learn the concepts behind the TGfU approach in greater depth. Through research, writing, editing, and formatting, the candidates were required to read the content and many explained that it enabled them to gain a deeper understanding of the concepts involved. Additionally, the way the wiki created the content on one page made it easy for the participants to link the TGfU model to its applications within the different game categories.

The teacher candidates also indicated that creating games on the wiki allowed them to work together collaboratively. The open and flexible nature of the wiki allowed the participants to complete the assignment together yet at their own pace. While some teacher candidates were not comfortable or did not have the prior knowledge to create new games, others created games with ease. It appeared that those teacher candidates who were not comfortable in the beginning were later able to contribute by building onto the already created game. They explained that the biggest advantage of using a wiki to create games as a group was the scaffolding. When one contributor created a game, another was able to add to that game and this then sparked more ideas from others. It seemed that the wiki provided the participants with a cycle of constructing and deconstructing knowledge in order to encourage deeper understanding of the TGfU

approach and its application within games. The teacher candidates were able to construct their own understanding by building on prior knowledge or the knowledge of others, especially when they created original games. In addition, by reading, editing and creating the text on the wiki, they were able to deconstruct this knowledge and discover the underlying philosophy and ideas that form the basis of the TGfU approach.

Through my third sub question I wanted to gain an understanding of how wikis could facilitate the scaffolding of ideas to create deeper content knowledge. Throughout this study, it appeared that scaffolding or building on each other ideas was a form of collaboration that the teacher candidates were not necessarily familiar with. This study showed that the wikis not only facilitated the scaffolding of ideas but also facilitated collaboration among the participants. As mentioned in the discussion, collaborating on a wiki is very different from collaborating in a traditional group project where students divide up the work and later put all the pieces together. The wiki created a place where all the work can be produced together through scaffolding. When the professor initiated this assignment, a scaffolding script was designed to assist the teacher candidates in their research. In order not to overwhelm the participants, the professor decided to provide the script in three sections. The way the script was provided lends itself to gradually allowing the teacher candidates to learn how to contribute and collaborate on the wiki.

First, the teacher candidates contributed at a more individual level, focused on creating text through research or from prior knowledge. The second section allowed the teacher candidates to create links between prior knowledge, the content of the first section and the research. At this time, they started to build on what they had learned from

the first section. In the final section, open ended scaffolds required the teacher candidates to understand the content and apply it to a game they had to create. At this level, the participants began to create games and build on each other ideas to refine the games. The wiki seemed to provide an online network where a group of people from different backgrounds, experiences and perceptions can create content by adding to each other's ideas in order to create a more refined product.

The teacher candidates stated that a wiki provided them with a new dimension of group work where the contributions of the individual participants fed the collaborative efforts of scaffolding from the group. This shows that through using the wiki, the participants learned to collaborate and were encouraged to gradually become more independent and interdependent thinkers and contributors. The study illustrated that this emergent system of scaffolding seemed vital to the success of learning when using a wiki. In addition, this study indicated that the teacher who provided the scaffolding script must also offer continued support and guidance throughout the process in order to maximize overall success.

After reviewing the literature on wikis, research indicated that wikis may have a positive impact on the writing and computer skills of wiki users (Choy & Ng, 2007; Engstrom & Jewett, 2005; Leuf & Cunningham, 2001; Mader, 2006). Within this study, I questioned the participants on how they perceived wikis influenced their writing and computer skills and they provided me with some clear answers. First, the six week wiki project did not seem to have a direct influence on the teacher candidates' general computer skills. They did acknowledge that throughout the assignment they became

accustomed to the wiki functions and this seemed to have a positive effect on their comfort level when contributing to the wiki. The teacher candidates did explain that using the wiki had an impact on their writing skills. They rationalized that reading, researching, writing, editing, paraphrasing and formatting the text of the wiki augmented their general writing skills. Because the content of the wiki would be published immediately on the World Wide Web, some teacher candidates stated that it encouraged them to pay close attention to their writing style, spelling and grammar. Over the course of this six week project, the reflections of many teacher candidates signify that wikis can positively impact the overall literacy skills of students.

A different question posed by Ellis (1998) to assist in the evaluation of an interpretive study was to explore the effects the research had on the participants, the related literature and myself, the researcher. Some participants explained that the wiki project helped them see the potential a wiki has for educational purposes. They mentioned that they would like to use a wiki within their own teaching. The simplicity of the wiki technology seemed to influence this decision as some believed wikis can be used by younger participants. Within the area of physical education, wikis can be used by students and teachers for a variety of purposes such as creating a PE dictionary, writing collaborative papers on health and physical education, constructing a PE textbook, distributing lesson plans, developing games and even planning school events. In light of the new independent Physical Education course in Manitoba (Manitoba Education, 2007) as well as the new grade 11 and 12 curriculum (Manitoba Education, 2006) that offers out

of class options, a wiki may be used for students to collaborate on several topics related to health and physical activity.

Even though Ward Cunningham developed the first wiki, wikiwikiweb, in 1995, studies investigating the use of wikis in education have only recently been initiated. Due to the abundant possibilities for using wikis in education, research about the use of wikis can be valuable to the teaching profession. This study broadens the knowledge base within educational research in many ways of which I list a few. First, the data suggests that collaboration on a wiki is in itself a learning process. The emergent scaffolding design can be implemented to increase the potential of collaborative projects. Second, the findings revealed that when using a wiki to gain deeper knowledge regarding specific concepts, the role of i) the designer of scaffolding scripts and ii) the facilitator of the scaffolding process seems vital to the success of the learning. Third, the findings indicate that using a wiki in PETE programs can provide a place for teacher candidates to collaborate on pedagogical topics such as teaching games. Extending the learning environment by using wikis may be a valuable contribution to the area of education. Finally, the data illustrated that in schools, wikis can generate communal knowledge building environments that extend the learning experience and encourage students to not only learn from each other but also to teach each other. Incorporating technology such as a wiki can provide for more student-centred research projects to allow learners to explore and broaden their own knowledge base while improving their overall literacy skills.

This study had and will continue to have a major impact on me as a researcher, student and teacher. First, the study allowed me to explore a new instructional tool and

discover the many positive implications it may have on education. Second, the study encouraged me to create a new 'global TGfU wiki' that will invite participants from all over the world to build international links and enhance collaboration between teachers, teacher candidates, teacher educators, researchers and students. After presenting the preliminary results of this study at the International TGfU Conference in May, 2008, I was inspired to create this new wiki that would provide a service to the growing TGfU professional community. This global wiki (<http://tgfu.wetpaint.com>) will have different functions such as but not limited to: establishing an active dialogue around teaching games; supporting the overall PE community in their efforts to teach games effectively; providing a place for researchers to disseminate their findings and translate knowledge into practice; and connecting teachers to explore game progressions and lesson plans. Finally, this research has given me the skills I need to grow both as a teacher and as a new scholar in the field of physical education teacher education. It has allowed me to explore interpretive research and enhance my curiosity for research within my field as well as in the field of educational technology. The implications for further research will shed light on how I see the possible use of wikis within the area of physical education teacher education.

#### Implications for further research

This study provides a jumping board for many new research possibilities within schools, universities and businesses. Wikis can create links between people all over the world through the World Wide Web. As an option for a follow-up study, I propose that the project would continue on to allow one more level of scaffolding. At a fourth level,

the teacher-produced scaffolds would be removed and teacher candidates would begin to create their own scaffolds depending on what they know and what they wish to learn. As the teacher candidates from this study go on to work as new teachers within the school system, in the near future, a wiki could provide support and continuous professional development for these novice teachers. In the fourth dimension, the community of people such as students, practitioners, and professionals who participate in the wiki will function as scaffolds. As the teacher educator's role is removed, new teachers can use the wiki as a resource and a tool to continue to build on their understanding of teaching games.

Learning does not end when you graduate and many complexities of TGfU, as described before, have yet to be discovered by these new teachers. In order to create success as a new teacher teaching games using the TGfU approach, a collaborative global network could encourage more scaffolding opportunities. As teacher educators, novice teachers, expert teachers, student teachers, and researchers are invited to join this "global" TGfU wiki, everyone can bring unique perspectives to the wiki. These experiences and knowledges can be shared and built on by using a wiki and as a result could provide teacher candidates and teachers with the support they need to teach games using a more student-centred approach. Perhaps this global wiki can create new links within the physical education community and encourage everyone to "play" creatively and collaboratively with games.

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## Appendix E Wiki – TGFU Project Outline

The purpose of this project is to promote the use of wiki's in order to facilitate a more in-depth inquiry/dialogue about the *Teaching Games for Understanding* Approach for teaching games. Through the use of wiki's, we can build on each others' ideas (scaffolding) and also develop effective constructive feedback skills. At the same time, we can deepen our understanding of the TGFU approach through research and online submissions.

The class will be divided into 4 groups. This will be done by drawing numbers from a hat. There will be 7 sets of numbers from 1 through 4. Once the names are drawn, we will then draw again for the category for your group:

- # 1 Net/Wall
- # 2 Invasion/Territory
- # 3 Striking/Fielding
- # 4 Target

We will dedicate 2 classes to working on this project (these classes will be designated by the professor). The expectation is that the groups build on each others' ideas from week to week. Please refer to the attached schedule to understand due dates and submissions. Each week, each group member will be expected to contribute to the wiki in two ways: a) add to the text of the project with additional research and ideas; b) edit sections of the project. There is no maximum number of entries per week, but there is a minimum of 1 entry for both a) and b) as described above.

Starting the week of January 21/08, each group member must have completed their weekly entries and edits by Thursday at 7 pm. As indicated on the schedule, this will continue each week for 5 weeks with the final project completed on Thursday February 21/08. Additionally, every Friday (Jan 25, Feb 1, 8, 15, 22), each student will submit a "reflection" paper to Dr. Casey during class. These reflection papers must be typed.

### Format of the TGFU project

1. Overview of TGFU approach
  - History
  - Philosophy behind the model
  - The model (diagram: adapted from original model))
  - Explain/Describe each step in the model
  - Exaggeration, simplification etc

2. Overview of Specific Category: Net/Wall, Striking/Fielding, Invasion/Territory, Target

- General information about category
- Transferable skills, strategies and tactics

3. Game Progression

a) Game Sequence # 1

- Tactical Problem/Focus
- Skill Focus
- Introductory task or game

Must include:

- ✓ Description
- ✓ Representation
- ✓ Simplification
- ✓ Exaggeration
- ✓ Modification
- ✓ Questions

- Skill /Concept development through Task/Game

i. Must include:

- ✓ Description
- ✓ Representation
- ✓ Simplification
- ✓ Exaggeration
- ✓ Modification
- ✓ Questions

ii. Must include:

- ✓ Description
- ✓ Representation
- ✓ Simplification
- ✓ Exaggeration
- ✓ Modification
- ✓ Questions

b) Game Sequence # 2

- Tactical Problem/Focus

- Skill Focus
  - Introductory task or game
  - Skill /Concept development through Task/Game
- i. Must include:
- ✓ Description
  - ✓ Representation
  - ✓ Simplification
  - ✓ Exaggeration
  - ✓ Modification
  - ✓ Questions
- ii. Must include:
- ✓ Description
  - ✓ Representation
  - ✓ Simplification
  - ✓ Exaggeration
  - ✓ Modification
  - ✓ Questions
- increase complexity of skills and strategies from one “game” to the next  
 -transferability among sports  
 -change equipment ... increase complexity

## Appendix F

**PRE-WRITING SAMPLE Wiki/TGfU Project****Question 1: TGfU**

a) Describe your current understanding of the “TGfU” model:

b) The TGfU approach has been identified is an effective approach to teaching games. Do you agree with this? Explain.

**Question 2: Group work**

a) Tell me about your previous experiences doing group work at the university. Describe any challenges and successes related to participating in group work projects.

b) Have you participated in assigned group projects which required you to work with peers outside of the classroom? Can you explain what this was like?

### Question 3: Computer and writing skills

Rate your skill level in each of the areas below according to the rating scale.

	1- Poor	2- Satisfactory	3- Good	4- Very good	5- Excellent
1) Overall writing skills	1	2	3	4	5
a) Spelling	1	2	3	4	5
b) Grammar	1	2	3	4	5
c) Editing	1	2	3	4	5
d) Vocabulary	1	2	3	4	5
e) Organization of thoughts	1	2	3	4	5
2) Overall computer skills	1	2	3	4	5
a) Copy and paste information	1	2	3	4	5
b) Word processing	1	2	3	4	5
c) Keyboarding skills	1	2	3	4	5
d) Using search engines	1	2	3	4	5
e) Email	1	2	3	4	5

## Appendix G

**Wiki/TGfU Project Schedule**

<b>Date</b>	<b>Tasks to be completed each week</b>	<b>✓</b>
Fri. Jan 18/08	-introduction to wikis: computer lab #	
Thurs. Jan 24/08	-1st entries and edits must be completed	
Fri. Jan 25/08	-reflection # 1 submission due	
Thurs. Jan 31/08	-2 <sup>nd</sup> set of entries and edits must be completed	
Fri. Jan 25/08	-reflection # 2 submission due	
Thurs. Feb 7/08	-3 <sup>rd</sup> set of entries and edits must be completed	
Fri. Feb 8/08	-reflection # 3 submission due	
Thurs. Feb 14/08	-4 <sup>th</sup> set of entries and edits must be completed	
Fri. Feb 15/08	-reflection # 4 submission due	
Thurs. Feb 21/08	-5 <sup>th</sup> (final) set of entries and edits must be completed	
Fri. Feb 22/08	-reflection # 5 submission due	

<b>Date</b>	<b>Minimum # words entered in each section Per Group</b>	<b>✓</b>
<b>Thurs. Jan 24/08</b>	Overview of TGFU approach: 150 Overview of Specific Category: 100 Content Analysis and Game Progressions:	
<b>Thurs. Jan 31/08</b>	Overview of TGFU approach: 200 Overview of Specific Category: 150 Content Analysis and Game Progressions:	
<b>Thurs. Feb 7/08</b>	Overview of TGFU approach: 300 Overview of Specific Category: 200 Content Analysis and Game Progressions:	
<b>Thurs. Feb 14/08</b>	Overview of TGFU approach: 400 Overview of Specific Category: 250 Content Analysis and Game Progressions:	
<b>Thurs. Feb 21/08</b>	Overview of TGFU approach: 500 Overview of Specific Category: 300 Content Analysis and Game Progressions:	

## Appendix H

**Reflective Journal**

Name: \_\_\_\_\_

Group: \_\_\_\_\_

1) **Copy and paste all your creations and edits made over the past week and reflect on the reason why you made each change.**

2) **How has using wikis enhanced your skill levels in the following four areas using the rating scale provided? (1: Not at All, 2: Very Little, 3: Somewhat, 4: To a Great Extent)**

a) Understanding the TGfU approach	1	2	3	4
b) Practical application of TGfU approach	1	2	3	4
c) Writing	1	2	3	4
d) Computer usage	1	2	3	4

**Which of the four categories above provided you with the greatest level of improvement? Explain briefly.**

3) **Briefly explain your experiences, positive or negative, using wikis in relation to group work.**



**Question 2: Group work**

a) Tell me about the challenges and successes you experienced participating in the wiki group work project.

b) Do wikis change the way you feel about doing group work outside of the classroom? Explain.

**Question 3: Computer and writing skills**

Based on your work to date, how would you rate your skill level in each of the following areas?

	1- Poor	2- Satisfactory	3- Good	4- Very good	5- Excellent
1) Overall writing skills	1	2	3	4	5
a) Spelling	1	2	3	4	5
b) Grammar	1	2	3	4	5
c) Editing	1	2	3	4	5
d) Vocabulary	1	2	3	4	5
e) Organization of thoughts	1	2	3	4	5
2) Overall computer skills	1	2	3	4	5
a) Copy and paste information	1	2	3	4	5
b) Word processing	1	2	3	4	5
c) Keyboarding skills	1	2	3	4	5
d) Using search engines	1	2	3	4	5
e) Email	1	2	3	4	5

## Appendix J

**Wiki/TGfU Project FOCUS GROUP /INTERVIEW QUESTIONS**

- 1. Tell me about your experiences using the wiki.**
  - a. Did you find that wikis helped you to collaborate with each other on this project? Explain
  - b. How did you feel about adding text to the wiki?
  - c. How did you feel about editing each others' work?
  - d. What are the pros and cons of collaborating on a project using wikis?
  
- 2. Did you find that wikis allowed you to build on each other's ideas to create a deeper understanding of the content? Explain**
  - a. How did wikis allow you to build on each other's ideas?
  - b. What were the pros and cons of using a wiki to build on each other's ideas?
  
- 3. How did the wiki help you in terms of how you negotiate all the demands of your daily life?**

## Appendix K

**Research Schedule**

<b>Date</b>	<b>Task</b>	<b>People Involved</b>	<b>Place</b>
Upon receiving Ethics approval	Private meeting with professor regarding research + obtain consent + send out letter to Dean of the Faculty of Education	Professor, researcher	Office
Following ethics approval + consent professor	Introduction of thesis research to students	Students, researcher	classroom
February 29, 2008	- Obtain Consent from participants - Focus group discussions (4 sessions of 30 minutes each)	Researcher, students	Separate classroom
On request	Personal Interviews	Researcher, student	Researcher's office
March, 2008	Obtain assignment documents and select documents from those students participating in the research for further analysis	Researcher	Researcher's office
March / April, 2008	Transcribing focus group interviews / analyzing data		
May / June, 2008	Writing of the results		

## Appendix L

**RESEARCH INTRODUCTION SCRIPT**

This script describes what will be explained during the session between the researcher and participants.

Script:

My name is Helena Baert and I am a graduate student at the University of Manitoba in the Faculty of Kinesiology and Recreation Management.

I am interested in the wiki assignment that you are working on in this course at the moment.

As part of the requirement to obtain a Masters Degree I want to investigate your experiences during this wiki/TGfU assignment.

The purpose of this study is to investigate the influence of wikis on student learning as seen through the experiences of physical education teacher candidates in a wiki assignment on teaching games for understanding. The benefits of participating in this study include an increased understanding of the use of wikis as an instructional tool. Your participation in this research study will contribute to the pedagogical theory and practice of physical education and will not in any way influence your standing in the course. The research activities and my involvement will be separate from your regular class and your participation in the wiki assignment. Therefore, I will not be involved in the assessment of your wiki class assignment.

I am here today to request your participation in this research study.

If you choose to participate in this study, you will be asked to provide the researcher access to the documents associated with the wiki assignment. Following assessment of the wiki class assignment, all the wiki assignment documents will be copied by Dr. xxx and placed into envelopes with the students' names on the outside. Only those documents from students who provided consent will be used as data while the other documents will be shredded. These documents include the writing samples and reflective journals. Additionally, you are asked to participate in a structured thirty-minute focus group interview following the wiki class assignment. This interview will include three open-ended questions regarding your perceptions of using wikis as an instructional tool.

These focus groups will take place on Friday February 29<sup>th</sup>, 2008 during class time. Again, you may choose to withdraw your participation in the study at any time without penalty. With Dr. xxx's prior permission, students from each of the four previously assigned groups (for the wiki assignment), consisting of seven students, will join me to a room away from the general classroom while all other students stay in class with Dr. xxx. Students who choose not to participate in the study will have 20-30 minutes of free time. I will arrange for all students to return to class at the same time. If you withdraw from

this study, your documents will be shredded and therefore not used in the write-up of the final results.

If you prefer to express your opinions in private, a personal interview with the researcher can be arranged. You may email me to request a personal interview at any time. Audio tapes of the interviews will be transcribed for analysis. The documents obtained from this study as well as the complete audio transcripts of the focus group will be kept secured in a locked cabinet to which only the researcher will have access.

**There are no risks involved in participating in this study and you may choose not to participate, you may withdraw from the research at any time without penalty and you will have the opportunity to review the interview transcripts and make changes. All of the information will be kept secure and confidential during the study and for 5 years after, upon which it will be destroyed at that time. As a means to protect confidentiality, all the identifying criteria will be replaced with pseudonyms during the data analysis and reporting of final results. If you wish to be notified of the final research findings, please inform the researcher at any time within the study. You may contact me at any time through email at xxx**

I will hand out consent forms which you may read in your own time. For additional questions you may contact me through email at all times. This research study is completely separate from your coursework and communication regarding this study should only be directed to the researcher in order to keep all communications private.

If you wish to participate in this study, please complete the consent form and bring it with you on Friday February 29<sup>th</sup>, the day of the focus groups. If you wish to speak with me in private, please email me to set up a meeting.

I thank you for your attention and wish you good luck on the completion of the wiki assignment.

(Give out consent forms)