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WebQuests: A scaffolded learning structure to develop higher order thinking

Dissertation



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I hereby certify that this material, which I now submit for assessment of the programme of study leading to the award of Master of Science in Learning Technologies is entirely my own work and has not been taken from the work of others save and to the extent that such work has been cited and acknowledged within the text of my work.

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1. Abstract

Military forces develop skills based on the principles of drill and practice, from a civilian perspective this type of rote learning canw also be seen in education where students are taught the skills to successfully pass examinations and not necessarily the skills required to develop a deeper understanding of a subject. The purpose of this study is to investigate whether the use of a scaffolded learning structure such as a WebQuest can be used to effectively develop higher order thinking.

This research question will be addressed by reviewing scaffolded learning and WebQuests and how they aid the development of higher order thinking skills. The study will also examine Bloom's Taxonomy of the Cognitive Domain and the use of Social Constructivism will be reviewed by forming small groups of subjects and analysing their online discussions through the life-cycle of the study.

The measurement and analysis will be conducted through a number of means both quantitative and qualitative. A pre and post study survey will be given to all students to determine a snap-shot of current trends from which the post-study survey will be compared against later. Students will be required to complete an individual WebQuest which will measure the current level of higher order thinking displayed. These results will be compared to a group WebQuest assignment which will assess the effect of collaboration on the assessment scores.

The results from this study prove that through the use of scaffolded support and collaboration, students can improve their assignment scores by approximately 20% on average. These results also indicate that this method can effectively direct students learning and gain higher order thinking skills moving beyond simple rote learning and towards the higher levels of Bloom's Taxonomy. This method could be considered as an appropriate method for the development of critical thinking skills.

2. Introduction

Much of the learning conducted in the Irish Defence Force is based on “drill and practice” using Gagne’s “Nine Events of Instruction” and rote learning as suggested by Skinner’s “Operant Conditioning” through reinforcement, shaping and conditioning (Kearsley, 2006). As a result of these teaching methods students become capable of effectively solving problems or questions which relate to individual areas and which are in a logical sequential manner. However, problems are rarely so simple and straight forward. There is a strong need to develop educational methods which encourage students to move beyond rote learning and develop higher order thinking skills such that principles learnt in the traditional manner can be concurrently applied to multiple areas and to solving non linear problems.

The purpose of this study is to investigate the effectiveness of WebQuests as a learning support tool as students develop their level of knowledge beyond basic rote learning towards higher level of Bloom’s taxonomy such as Analysis, Synthesis and Evaluation (March 2002-2006).

2.1. Literature Review

A number of eLearning initiatives have been developed in the Reserve Defence Forces (RDF) over the past years, such as the development of a number of distance education courses. The most successful of these is the RDF Infantry Young Officer Course (Galvin; Lally & Bergin, 2006). This course is designed to develop Junior Officers to the point that they can effectively assume the role of a Platoon Commander.

It has been noted by the instructors involved with these courses that the quality of training given to students has remained relatively consistent over the years but the level of deep understanding of the topics presented to the students has not increased beyond simple rote learning. Students have shown the ability to apply the principles taught to “text-book” problems but when presented with problems requiring a deeper understanding of the issues, students struggle to develop appropriate solutions. In the military, as in civilian employment, there is a need to develop staff that can do more than simply follow set procedures. Staff must be able to analyse a problem, relate it to

the various principles taught and determine the best course of action using the appropriate method. Outside of the classroom, problems are rarely simple and straight forward. The development of training methods that encourage students to move beyond rote learning into higher order thinking enabling students to develop connected, categorised and manipulated facts into new solutions is required (Thomas, Thorn & Small, 2000).

This problem is not unique to the RDF or the military, many courses such as the Microsoft Certified Systems Administrator (MCSA) or the European Computer Drivers License (ECDL) courses produce students who can follow the step-by-step sequence to solve a problem or achieve a goal (e.g. mail-merge, query a database etc.). The training methods used do not encourage a deeper understanding of the material; generally this is achieved after the course with experience. In other words, after finishing the course students have only developed knowledge on the lower scale of Bloom's Taxonomy.

When looking at education, we should ask ourselves to evaluate the level of knowledge and understanding achieved by our students and ask, "have we successfully imparted the principles and skills of problem solving so that our students can effectively apply these principles in a wide range of situations?" or "have we simply provided enough information so that students can successfully solve standard problems?" One method which can be used to develop this higher order thinking skills is through the use of a scaffolded learning structure. Scaffolding is used to organise and support a student's investigation of a problem. The scaffolding also helps to prevent the student from straying too far "off the path" while seeking a solution (McKenzie, 1999). Research has shown that some of the more effective learning styles place a learner in a situation which requires them to develop skills and/or knowledge in order to successfully solve a problem (Oliver & Omari, 2001). In addition, there is evidence to support the idea that students learn more from problem oriented tasks than from a fact oriented ones with reports of increased critical thinking skills and a deeper understanding of content have been also reported in studies conducted in this area (Oliver & Omari, 2001).

This dissertation is based on the premise that current educational methods are failing to develop higher order thinking skills, instead, they produce students who have become very effective at examination skills (study skills, cramming, identification and regurgitation of key concepts) in order to obtain points (McWilliams, 2004). The development of a scaffolded learning strategy such as a WebQuest will be investigated to determine the level of success in this particular study when trying to encourage students to develop higher order thinking skills and in teaching students not what to think but how to think.

2.1.1. What exactly is a WebQuest?

Traditional teaching methods throughout history have relied on the principle of the transmission of knowledge from teacher to student through word of mouth. Learning technologies have not significantly changed the basic top-down approach to teaching (Benz, 2001). In recent years with the explosion of information currently available on the Internet many educators tend to see the Internet as an online library or document. However, Benz suggests that “the Internet is better suited, in my opinion, to another form of knowledge acquisition, a ‘mutual’ learning situation that emphasises students’ autonomy and encourages them to take responsibility for their own learning practices” (Benz, 2001).

With the availability of this on-line material there is some recognition that teachers are now required to think more creatively on how they may employ these information sources while also providing engaging material for their learners (Oliver & Omari, 2001). This new approach in the delivery of material to students was noted by Leahy and Twomey (2005) who said “the revised Irish primary school curriculum (1999) embraces a constructivist philosophy of education, promoting a developmental approach to learning where each child is seen as an active agent in his/her learning.” The central item in this curriculum is the development and use of guided activities, self discovery and reflection as both an individual and in collaboration with other students (Oliver & Omari, 2001 and Leahy & Twomey, 2005).

The importance of the distribution and transfer of information is transforming our modern society into an information society where citizens are confronted with

technology impacting on almost all aspects of their lives (Wopereis & Brand-Gruwel, 2004). The challenge for education is to determine the best ways of integrating current Information Communications and Technology (ICT) into our classrooms so that it can enhance the transfer of knowledge (Reid, Labonne & Gibbs, 2001). The traditional role of “sage on the stage” also needs to be transferred to “guide on the side”, this ensures that students are not passively being lectured but that they become engaged in the material by being active participants in their own learning (Al-Bataineh et al, 2000).

It was found that the simple exposure to Internet resources are not enough to significantly improve student learning (MacGregor & Lou, 2004). Simply surfing the web can lead to the loss of precious instruction time and can also, if not monitored, lead to access to inappropriate material. A WebQuest offers a structured format which enables students to gather information and construct new knowledge and learning (O’Bannon, 2000). Braun suggests that WebQuests are a valuable tool for education and when they are “developed and organised with a clear sense of what students will learn and how to integrate print and electronic resources into that learning, WebQuests prove to be powerful tools to teach students about a particular topic while at the same time increasing their information literacy skills” (Braun, 2001).

WebQuests were first developed by Bernie Dodge and Tom March at the San Diego State University in 1995 and are defined as “an inquiry-oriented activity in which most or all of the information used by learners is drawn from the web. WebQuests are designed to use learners’ time well, to focus on using information rather than looking for it, and to support learners’ thinking at the levels of analysis, synthesis and evaluation” (Dodge, 1997). Using a WebQuest in this manner requires the students to use critical thinking and collaboration to solve real-world problems (Erthal, 2002). This structured approach to using the Internet as a learning resource helps to focus those involved into suitable areas of the web “otherwise, the World Wide Web becomes similar to having 500 TV channels” (Erthal, 2002). During a study of WebQuests, O’Bannon quotes one of her students who suggested the benefit of WebQuests is that “they offer students an escape from the same old routine, and in the process, motivate and encourage them to learn. It brings students out of their desks

Dodge (1997) suggests that WebQuests may be either short-term or long term in their duration. A short term WebQuest has the instructional goal of knowledge acquisition and integration where a learner can be made aware of a significant amount of information and make sense of it similar to the lower levels of Bloom's Taxonomy. This type of WebQuest would typically last from one to three class sessions.

A long term WebQuest on the other hand has the instructional goal of extending and refining knowledge. In order to achieve this goal, the learner is required to demonstrate the higher levels of Bloom's Taxonomy by analysing the information and using this deep understanding to create something which others can respond to, for example, the user could be expected to analyse the causes and effects of global warming, then using this new information, review their own negative effect on global warming and develop an action plan to reduce carbon emissions in the future. This type of WebQuest would typically last from one week to one month of a classroom setting (Dodge, 1997).

The main purpose of the WebQuest model is to harness the advantages of the resources available on the Internet while also focusing students to complete the task. In order to achieve this efficiency and clarity of purpose the following six sections are critical attributes of a WebQuest and are required for both short term and long term WebQuests (Dodge, 1997; Middlebrook, 2002; Schrock, 2002 and Matsuoka, 2004):

- **Introduction** – The purpose of the introduction section is to set the stage of the exercise for the learners by providing an overview of the learning objectives and attempting to motivate the students to begin the WebQuest.
- **Task** – The task is a clear formal description of what the students are required to accomplish by the end of the exercise. It is vitally important that the task is pitched at the right level for the student in that it is both achievable and interesting.
- **Process** – Here the students are given explicit details of the various steps required to be accomplished in order to achieve the stated task. It is important to support the students attempting the exercise by breaking the process into

small clearly described steps; this will guide students in attempting to complete a complicated task.

- **Resources** – This section of the WebQuest is sometimes referred to as the “Information Sources”. The purpose of this section is to focus the students on the specific sources of information which the teacher has already reviewed and deemed appropriate. This vetting of resources by the teacher helps to ensure that students are not left aimlessly wandering the Internet. The resources used for the WebQuest are not necessarily restricted to information available on the Internet, as suggested by Matsuoka (2004) on her website, resources “can include things like videos, audio cassettes, books, posters, maps, models, manipulatives and sculptures. Visiting lecturers, team teaching, field trips, and other motivational techniques can also be used.”
- **Evaluation** – The evaluation tool used in WebQuests is a rubric. Rubrics offer both student and teacher a clearly defined set of criteria in which their submissions can be clearly and consistently measured against. These rubrics are made available to the students from the beginning of the exercise so that they may independently assess their performance and receive guidance on the expected standards required from the teacher.
- **Conclusion** – It is at this stage of the WebQuest that students are reminded of the learning objectives of the exercise and they are given an opportunity to reflect on the exercise, discuss the points raised and how they might be extended into other domains. Matsuoka (2004) suggests that this last stage of the WebQuest follows the constructivist principle where “we learn by doing – but we learn even better by talking about what we did.” This stage of the exercise is also an ideal opportunity to engage with the students on how the WebQuest may be improved on in the future or suggesting other WebQuests.

In addition to the critical attributes of a WebQuest there are three additional non-critical attributes which may be also included if required (Dodge, 1997 and Schrock, 2002).

- **Group Activities** – The constructivist approach to WebQuests leads to the use of group activities where students can share their knowledge and experience helping each other, while also reinforcing their own understanding.
- **Role Playing** – In order to increase the motivation of the students the learners are encouraged to adopt a role to play during the exercise (e.g. scientist, famous person from history, or a reporter). While using role play the students are also given a clear scenario to work within while playing the role.
- **Single Discipline or Interdisciplinary** – For novice teachers the best approach to developing a WebQuest is to take a single disciplinary approach until they are comfortable with the process. The benefits of taking the interdisciplinary or holistic approach to the WebQuest is that students can try real-world problems and solutions while gaining an understanding of how their choices and decisions can affect other areas.

2.1.2. Advantages and disadvantages of WebQuests

Research has shown that the traditional delivery method of face-to-face classes are proving less and less stimulating and interesting for students, because of this there has been a noticeable increase in absenteeism from face-to-face third-level classrooms noted in the research of Bligh (1998) and Maloney and Lally (1998) (cited by Hassanien, 2006). Through the inventive use of a WebQuest exercise Hassanien (2006) suggests that both of these factors can be successfully addressed. Because of the structured bibliography developed by the teacher before the commencement of the WebQuest students are freed from the burden of sifting through volumes of useless or irrelevant data. Instead all of their time is invested into the evaluation and assimilation of the presented information into their pre-existing schema allowing the students to develop their knowledge of the topic in question.

The second issue noted by both Hassanien (2006) and Benz (2001) is the issue of distraction. Benz identifies this problem by noting that students “try a search engine and eventually wind up gazing at pictures or motorcycles or guitars, reading the latest news about their favourite video game, or downloading software for their calculators”

(Benz, 2001). The bibliography developed by the teacher reduces the temptation for the student to research other sources of information, helping them to focus on the problem at hand.

A further three advantages were noted by Hopkins-Moore and Fowler (2002) in their study on the effects of changing teaching practices for online courses. They argued that because of the higher levels of thinking produced by students as they progressed up the upper levels of Bloom's Taxonomy, they observed that students were constructing their own knowledge and meaning of the material being presented. The idea of the didactic approach to learning is replaced with student centred learning. The second advantage suggested by Hopkins-Moore and Fowler was that the WebQuest enabled an array of learning styles and preferences to be used by students such as "aural, kinaesthetic and visual learning styles" (Hopkins-Moore and Fowler, 2002). The third advantage suggested in this study was the use of a collaborative approach to learning and task management. The importance of collaboration and evaluation skills is argued by David Thornburg, a futurist and technology specialist, who suggested that the tomorrow's workers will be required to work in teams and because of the explosion of access to quality information thanks to the uptake of Web 2.0 technologies the ability to research, analyse and evaluate this information will become more and more important Thornberg also observes that WebQuests serve as a solid foundation in developing these necessary skills in the workforce of the future (Matsuoka, 2004).

An article by Karen Wood (2003) compiles the following list of advantages for the continued development and use of WebQuests in education.

- Because of the use of collaboration and teamwork students learn to work with others.
- As noted with Thornburg above, Wood highlights the need to develop evaluation skills in light of the abundance of information currently available.
- The development of ICT skills such as Internet, presentation and word processing skills aid in the development of the student.

- WebQuests offer the maximum use of effective time by allowing students to use information rather than looking for it.
- Students' attention is captured by the WebQuest and helps students to take ownership in their own learning.
- The use of role-play allows the students to develop an empathy with the subject.
- WebQuests offer a reusable format to the teacher after the initial workload.
- Because the teacher is no longer force feeding the students information it allows the teacher to concentrate on learners who are more in need of the teacher's time.
- As previously noted by Hopkins-Moore and Fowler (2002) WebQuests offer the students the ability to engage in the subject using different learning styles.

There are a number of issues which affect the success of a WebQuest as an educational tool for learning. Strickland in his study of instructional strategies noted that there is a lack of empirical evidence of the benefit of WebQuests over traditional teaching strategies (Strickland, 2005). Additionally, during an online discussion with the developer of WebQuests, Bernie Dodge, it is stated that "there is very little in the way of empirical research on the effects of WebQuests on student learning and on elements that make an effective WebQuest" (Dodge, 2003).

It is also noted by Matsuoka (2004) that although WebQuests have a number of advantages in teaching and learning, they are not an effective strategy for the teaching of the ability to recall facts and figures, simple procedures and definitions. Because of the preparation level required from the teacher before the WebQuest begins, such as researching resources for students and developing rubrics, the lack of time for teachers to gather these essential elements of the WebQuest can be a difficult hurdle for its implementation (Strickland, 2005).

Because of the current practice of didactic instruction and directed learning in schools, when students are first faced with a WebQuest they “often feel insecure and uncomfortable and are unable to learn effectively” (MacGregor & Lou, 2004) using this new strategy. Strickland also notes that at first the necessary social skills to effectively participate in this collaborative learning style are often missing and teachers are advised to expect some confusion and problems until students learn how to adapt to this type of learning environment (Strickland, 2005).

An article by Karen Wood (2003) compiles the following list of disadvantages for the continued development and use of WebQuests in education.

- Having the teacher research the Internet to find suitable resources for the particular lesson can place a large burden on the teacher to develop the WebQuest while also continuing normal classroom activities.
- Because of the predominately text based nature of the Internet finding material which suits all reading abilities can be difficult, therefore learners are required to have a certain minimum level of reading ability in order to attempt a WebQuest.
- For the same reason as above, students with various learning difficulties or disabilities may not be suited to the use of WebQuests.
- One of the biggest problems with the Internet is the rapid changing nature of the content available. After spending many hours finding suitable material within a relatively short period of time these links may become obsolete, changed or deleted. Wood suggests that before every WebQuest teachers check these links to ensure that they are still suitable.
- It may be possible to download these important links to resources and navigate to this information offline, but this would require a certain level of technical knowledge on the behalf of the teacher. Inevitably, something will go wrong, Internet connect failure, server crash etc. will happen sooner or later, it is therefore imperative to have a backup plan in place for this likelihood.

2.1.3. Bloom's Taxonomy and Higher Order Thinking

As discussed earlier, traditional teaching methods revolve around the principle of transmitting knowledge from the teacher to the student. It has been suggested that although students have the skills required to surf the Internet, many “lack the strategies necessary to efficiently and effectively negotiate the reams of available information” (MacGregor & Lou, 2004). Because of the availability of multimedia and interactivity on the Internet and the freedom of travel from site to site many students are not quite sure what to do with this autonomy. It is the responsibility of the teacher to channel and facilitate this advantage and exploit it to its fullest (Benz, 2001). The key to an effective WebQuest is in using information gathered to develop something new rather than just presenting your findings and the use of open-ended questions does not normally develop conclusive answers but tends to lead to further questions (Hopkins-Moore & Fowler, 2002). When participating in a WebQuest “students are not only learning factual information but, they are classifying, evaluating, synthesising, forming and testing hypothesis, making decisions, forming opinions, and participating in many other higher level thinking activities” (Strickland, 2005).

Bloom's Taxonomy is the result of a group of educators who began the task of classifying educational goals and objectives. Their objective was to create a classification of behaviours which are important when developing learning. From this task the following framework of three domains was created and has remained the de-facto standard for almost 50 years (Forehand, 2005):

In the traditional classroom there is a didactic approach to learning where the teacher spoon feeds the students the pre-packaged information telling them what to learn and how to learn it (MacGregor & Lou, 2004). However in the digital age where access to volumes of information is only a click away, the problem becomes one of sifting through this volume of information to find the answers required. Due to the potential information overload students are required to possess higher order thinking skills such as analysis, evaluation and creation.

A very simple definition of higher order thinking is that it is more than simply memorizing facts and figures, sometimes referred to as rote learning or learning “off-by-heart” where the students do not need to think about the information they just need to recall it (Thomas, Thorn & Small, 2000). If we wish to achieve higher order thinking we need to do something with the information available. We need to categorise the information and connect it to pre-existing information already stored internally. Using this new internal model we can now apply this to the real-world and attempt to develop new solutions to existing problems. This idea of an internal model was first suggested by F. C. Bartlett and was referred to as Schema Theory. Bartlett suggested that each learner had three different possible reactions to new information (Jennings, 2005):

- **Structuring** – Where new schema are created if no existing schema is able to adopt this new piece of information.
- **Accretion** – Here the learner takes the new information and assimilates it into an existing schema without changing the overall structure of the existing schema.
- **Tuning** – In this case the learner needs to adjust an existing schema to accommodate the new information.

By designing education courses which require the development and use of higher order thinking skills we can “prepare our students for the society which does not yet exist and in doing so, provide them with opportunities to critically assess and

transform their experiences into authentic learning” (Ó Murchú & Muirhead, 2005). A number of common problems when trying to develop higher order thinking with students were suggested by Thomas, Thorn & Small (2000, p.10), each of these issues can be addressed through the use of a WebQuest to support students as they learn to develop these higher order thinking skills, they are:

- **Poor grasp of the concept** – Using the Introduction stage of a WebQuest students are guided to identify the key items of the exercise. In addition good WebQuests develop a “foundation for all” stage where students are required to develop or revise the known facts before beginning the WebQuest in earnest.
- **Reliance on rote memory** – The issue with rote learning is that the student can recall facts and figures but is unaware of how this information may be used to solve a problem, WebQuest practice students in using information to achieve a pre-defined goal.
- **Problem identification** – In the WebQuest framework the problem is clearly identified to the students in the Task stage of the exercise. Once students are clearly shown the issue to be addressed they can focus on the task of gathering information and developing a solution.
- **Develop problem solving strategies** – The first task when deciding to tackle a problem is to develop an effective strategy to address the issue. Many different strategies can be employed to solve a problem, all possibly resulting in a successful outcome. Through a careful design of the WebQuest the teacher can steer the students towards an appropriate strategy using the Task and Process sections of the WebQuest framework.
- **Process selection** – Breaking a problem into manageable chunks can be difficult, even if you already know what your end goal needs to be. Using the Process section of the WebQuest the teacher has already clearly mapped out the required steps to successfully complete the process; with practice students will be able to apply these steps to similar problems.
- **Clearly state information** – Presenting the information at the end of the WebQuest should be reasonably easy for students if the previous stages of the WebQuest have been well laid out. At this stage the various groups of students

are required to collaborate on the structure of the final product and agree on the information presented. Reference to the rubric being used in the WebQuest can assist students in knowing what information is required and how it should be effectively presented to the teacher.

- **Allocation of resources** – In an ideal world the students themselves should be capable of providing the teamwork required to allocate the necessary resources to the task at hand by sharing the workload amongst the team. However, the teacher can assist in this through the careful selection of students by ensuring that there is a mixture of student skills and competences within each group before the WebQuest starts.
- **Evaluation of solutions** – Through the use of the rubric for the WebQuest the students will be able to clearly evaluate their work against the required performance from the teacher. From the teacher's perspective the use of the rubric also helps to ensure a consistent and fair approach to marking assignments.

2.1.4. Scaffolded learning

One of the essential elements of a WebQuest is the use of a scaffolded learning structure to support the students' performance beyond the current capabilities. The original term "scaffolding" was developed by Wood, Bruner & Ross in their 1976 study (cited by Lipscombe, Swanson & West, 2004) and is described as a metaphor for an instructional technique where the teacher provides assistance for the student to reach a goal or complete a task which they could not complete independently. The key element of the scaffolded support is that the student is only assisted to complete the tasks which are currently beyond their capabilities. Benson's 1997 study (cited by Lipscombe, Swanson & West, 2004) suggests that "scaffolding is actually a bridge used to build upon what students already know to arrive at something they do not know." Some examples of this type of scaffolding are "activities that help students develop the right mindset, engage students with the problem, divide activities into manageable tasks and direct students' attention to essential aspects of the learning goals" (Ngeow & Kong, 2001). Bernie Dodge sums up the importance of scaffolding

in relation to WebQuests with the following statement, “built into a good WebQuest is the notion of scaffolding. That by doing some of the work for the kids, a teacher scaffolds the kids’ performance – gives them a step ladder to stand on. So that by giving them partly done tasks, by giving them partly done structure, by going out and finding good resources for them, then the kids have a head start at accomplishing amazing things” (cited by Matsuoka, 2004).

The educational theory behind this scaffold is based on the aspect of schema theory which suggests that if we wish to help learners to perform a task which is beyond their current capabilities we should look at what experts in this area do to complete the task and try to break this down into manageable “chunks” which can be used to prompt the students into copying these steps (March, 2006). Over time the ultimate goal of the teacher is to promote the internalisation of the expert process and have the student claim ownership of them so that these new skills can be later transferred to another similar task without the need for the scaffolded support (March, 2006). One problem with scaffolding is finding the right balance of scaffolding required. Lipscombe, Swanson and West suggest that requiring students to complete tasks too far out of their reach can lead to frustration, while tasks which are too easy can also lead to this same frustration. It is therefore important that teachers understand the current level of knowledge of the students involved in the WebQuest so that their interests can be “hooked” or connected to the new information being presented and made relevant to the student so that the motivation to learn is increased (Lipscombe, Swanson & West, 2004).

Another key educational theory behind scaffolding is Vygotsky’s Zone of Proximal Development. Vygotsky’s theory suggests that each learner has two levels of development, the actual and potential development levels. Vygotsky (1978) suggested that “the distance between the actual development 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” is known as the zone of proximal development (cited by Galloway, 2001). This definition suggests that the Zone of Proximal Development can be viewed as the area between that lies between what they can do themselves (actual development level)

- **Provides clear directions** – The goal here is to anticipate any problems or issues which may arise during the study and develop a set of user-friendly instructions which will minimise confusion and help move students towards the learning outcome.
- **Clarifies purpose** – The scaffolded lesson is build around a real-world lesson and ideally an issue which is viewed as important to the students themselves. The students are told early in the lessons why these issues are important and given the bigger picture so that they may see the connections in their own lives. This enables them to view the lesson as a worthwhile study and one where they should apply their talents. As the students gather information they will be required to internally extend or refine their existing schemas to accommodate the new information.
- **Keeps students on task** – Having provided the general direction for the study the students are provided with “the guard rail of a mountain highway” (McKenzie, 1999). This enables the students and the teacher to ensure that although the students may be researching for information under their own direction this imposed structure will ensure students don’t stray too far off the pre-defined path and waste valuable lesson time.
- **Offers assessments to clarify expectations** – From the beginning of the study the students are made aware of the requirements and standard expected by the teacher at the end of the assignment. This guide helps students to aim at a target of quality and to understand the important areas of the study.
- **Points students to worthy sources** – The Internet through websites such as Wikipedia, Youtube/Google Video and the many different online databases has proven itself as a valuable source of information for both formal and informal research. The problem has become one of information overload; this issue can be greatly reduced or eliminated, depending on the cognitive and technical skills of the students, by providing relevant data sources for the students. McKenzie suggests that “in some cases students must stick to the sources pre-selected by the teacher. In other cases, the student may use these sites as a starting point, extending further out into Cyberspace in search of

something unusual. The scaffolding serves as an introduction, not as a corral” (McKenzie, 1999).

- **Reduces uncertainty, surprise and disappointment** – The ultimate goal of the teacher for using a scaffolded approach is to maximise the learning and efficiency of the lesson. In order to ensure this happens the various elements of the lesson should be tested for problems and where technology is being used alternative solutions should be considered. In addition when the lesson is finished a review of the success of the lesson should also help to refine the lessons for future students.
- **Delivers efficiency** – If done successfully a scaffolded lesson should “distil” the work effort required for both student and teacher showing obvious signs of efficiency (McKenzie, 1999). Instead of spending much of the valuable lesson time trying to source information, the time spent on the lesson is productive time where students are using the information available to create new understanding.
- **Creates momentum** – The momentum is used by the students to find out more about the subject and therefore increase their understanding of the topic being researched, “the channelling achieved through scaffolding concentrates and directs energy in ways that actually build into momentum” (McKenzie, 1999).

There are both challenges and benefits to the use of scaffolded learning in education. Lipscombe, Swanson and West (2004) suggest the following lists of challenges and benefits for the introduction of scaffolded learning:

- **Challenges:**

- Development of the scaffold can prove very time consuming.
- Lack of sufficient personnel.
- Finding the correct zone of proximal development which is just beyond the students' abilities can prove difficult.
- Not planning the students' needs, interests and abilities can result in frustration on behalf of the students and lead to a lack of interest.
- The full benefits of this type of instruction may not be seen unless the teacher has been properly trained in developing this type of lesson.
- As the students require less support the teacher needs to "step back", this can prove difficult for some teachers.
- Lack of specific examples for teachers to implement this type of instruction can prove difficult.

- **Benefits:**

- Using this approach may help to identify gifted students.
- This approach helps to personalise the instruction given and to engage the students.
- There is a greater assurance that the students will manage to acquire the desired skill or knowledge.
- Delivers increased efficiency and momentum as time spent on the lesson is actually time spent learning and not foraging for information which may not ultimately be required.
- The student, by being engaged in the subject, is also motivated to learn more and will take ownership of their own learning.

As noted above, one of the challenges for implementing this type of instruction is the lack of examples and tips for instructors who may be willing to pursue this type of instruction. Larkin suggests that teachers could follow the following techniques to ensure the successful application of scaffolding to their classrooms (Larkin, 2002):

- Begin by boosting the confidence of the students to this new form of instruction. Have the students begin with tasks which they can perform with little or no assistance.
- Help motivate the students by providing enough assistance in order to allow students to achieve quick success. This will also prevent students from quitting because of initial failures in the study.
- The social aspect of the study is important, help the student to “fit in” as research has shown that students will work harder to complete a task rather than let their team mates down.
- Avoid boredom by not overworking a skill once it has been successfully developed.
- Remember that the scaffolding should be removed gradually once the student begins to master the task. This continues until the task has been completely mastered, by which time the student should not require any scaffolded support.

Dodge (2000) suggests that a great WebQuest will build scaffolding as part of the essential structure to ensure students obtain high standards of submissions. Dodge recognises three types of scaffolded approaches which can be used in WebQuests, they are:

- **Reception** – This type of scaffold helps to assist students by providing support when gathering information from the suggested resources in the WebQuest. Examples include observation and listening guides, timelines and organisation charts.
- **Transformation** – The key difference in a WebQuest and a treasure hunt is that the students are asked to transform information into something new, this type of scaffold helps students place structure on the information so that patterns and common elements may be found. Examples include Venn diagrams and a weighted summary chart.

- **Production** – The production elements of the lesson can be supported through the use of templates and submission guides for assignments. Examples include presentation templates and assignment rubrics.

2.1.5. WebQuest Taskonomy

One of the most important elements of a WebQuest is the central task as it provides the ultimate goal of the study and the focus for the student. Dodge suggested that some WebQuests “do not represent the model well at all and are merely worksheets with URLs” (Dodge, 2001). Since the development of WebQuests in 1995 some common formats for WebQuests have emerged. It is likely that a normal WebQuest will combine the elements of two or more of the task categories described in this Taskonomy (Dodge, 2002). These tasks are closely related to the different types of role-play involved in a WebQuest where students take on the persona of a journalist or a historical figure in order to develop a deeper understanding of the topic.

- **Retelling Tasks** – This is probably the simplest of tasks where students are simply required to absorb some information and then demonstrate that it has been understood by developing a presentation or a short paper. This is probably the most common WebQuest type but Dodge (2002) considers them the least challenging/interesting. The issue with this type of WebQuest is that it can become a simple matter of copying and pasting information which is not a WebQuest. To prevent this, the WebQuest should require the submitted assignment to be significantly different from what was originally read and should require students to summarise and elaborate on what was read. This type of WebQuest is normally used when trying to develop a general background of the topic which will be built upon with later tasks.
- **Compilation Tasks** – This task requires students to gather information from a number of sources and compile it into a finished report. The compilation task practices students in making choices, organising, paraphrasing and chunking information. In order for this type of task to be a true WebQuest the students are required to somehow transform the information gathered into something new (Dodge, 2002).

- **Mystery Tasks** – A mystery task presents a puzzle or a detective story to the students for them to solve. This type of task requires students to combine information from a number of sources and make deductions from that data presented while also eliminating false trails which may seem like possible answers. It is suggested that roles such as historians and archaeologists fit well with this type of task (Dodge, 2002).
- **Journalistic Tasks** – Using this task, students are required to adopt the role of a journalist who must gather facts and report on an issue. In this type of task the importance is focused on the accuracy of the information rather than their creativity so that no reporting bias is presented. This type of task teaches students the importance of researching multiple accounts of an event and will require them to combine them to develop a true picture of events rather than simply taking information at face value which may be biased (Dodge, 2002).
- **Design Tasks** – Students are required to create or plan the design of an object within specific and authentic constraints in this type of task. An example of this type of task could be one where students are requested to plan the development of a playground park or other community resource given a strict budget and building constraints. Ideally this type of task should be based on a real need or requirement and the constraints should leave room for the flexibility and creativity of the students to emerge (Dodge, 2002).
- **Creative Product Tasks** – This type of task is similar to the design task mentioned above but is more open-ended and unpredictable. This type of task requires students to create something in a particular style or format such as a painting or TV show. As with design tasks the key to this task is in the constraints placed upon the students such as historical accuracy or the adherence to particular artistic style, however enough room for individualism and creativity should still remain in order to make the task interesting (Dodge, 2002).
- **Consensus Building Tasks** – This task is built on the idea that it is important to expose students to a series of differing viewpoints of a particular controversy which will be presented and considered by the students. This will require students to study different sets of resources which are an expression of

both personal opinions and facts (Dodge, 2002). A good example of this type of topic is the difference of opinions on evolution through natural selection and the idea of intelligent design by a supernatural entity, a topic which has stirred many legal cases in the United States in recent years.

- **Persuasion Tasks** – Persuasion tasks are often combined with consensus building tasks but are not always required. A persuasion task requires students to gather the key information on a topic and build a convincing case which will be presented to an external audience such as a legal trial or an election debate (Dodge, 2002).
- **Self-Knowledge Tasks** – This type of task is used infrequently, it tries to develop a greater understanding about the individual student such as “what do I want to be when I grow up?” This type of task should require the students to answer searching questions about themselves such as their long-term goals or their own self improvement by analysing their personal strengths and weaknesses (Dodge, 2002).
- **Analytical Tasks** – Analytical tasks help to develop the skills of students so that they can understand how things relate to each other. Students are asked to identify the differences and similarities of two or more objects and discuss the findings of this analysis (Dodge, 2002).
- **Judgement Tasks** – The judgement task requires that students are presented with a number of opposing views on a topic. They are then required to evaluate the information and make an informed decision on the subject. In this sense judgement tasks are similar to persuasion tasks, except this time the students are acting in the role of the Judge rather than the solicitor (Dodge, 2002).
- **Scientific Tasks** – Using this type of WebQuest, students are required to develop a hypothesis based on background information gathered, then plan and conduct a test on the hypothesis and finally report on the findings. The key to this type of WebQuest is in identifying a question which can be researched via the Internet, for example students could use the usage statistics on various websites to determine the optimum parameters for developing a school website.

2.1.6. *Developing great WebQuests*

Since the development of WebQuests in 1995 by Bernie Dodge and Tom March it has been hailed as a useful tool for the development of the necessary critical thinking skills required by students to work effectively in a collaborative learning environment (Erthal, 2002). Molebash and Dodge (2003) note that unfortunately very few teachers have any experience in creating inquiry based lessons and using them in traditional classrooms.

In order to assist teachers who wish to use the WebQuest model Dodge created a set of general guiding principles for the creation of a WebQuest which is captured in the word FOCUS (Dodge, 2001 and Hassanien, 2004):

- **Find good sites** – Finding good sites for your WebQuest can prove one of the most time consuming items in the development of a WebQuest, however, “you’ll want to find sites that are readable and interesting to your students, up-to-date and accurate, and come from sources your students wouldn’t ordinarily encounter” (Dodge, 2001). Learning how to effectively use a search engine will help narrow down the volumes of information which you will find on the Internet. Resources are not restricted to standard web pages, sites like YouTube or Google Video offer valuable multimedia resources. When gathering the WebQuest resources it is advisable to record its location on the Internet by using bookmarks for easy access later.
- **Orchestrate the learners and resources** – The planning and coordination that will be required to ensure both the learners and the necessary hardware resources are available at the same time will sometimes prove difficult. Students will need to be assessed to help determine their placement in the various collaborative groups which will be used during the WebQuest. The goal is to foster the sharing of information and knowledge among the group so students should be evenly matched and mixed in sexes and student background. From a hardware perspective some planning will be required to determine the availability of computers and the accessibility of the Internet, if required the necessary Internet resources can be downloaded so the lesson can be conducted from a local Internet cache.

- **Challenge the learners to think** – It has been recognised earlier that in order for students to succeed in industry and education in the future they will need to develop skills to analyse and synthesise information (Dodge, 2001 and Thornburg cited by Matsuoka, 2004). In the definition of a WebQuest March suggests that a good WebQuest is one that “transforms newly acquired information into a more sophisticated understanding” (March, 2003). Since the initial development of WebQuests “teachers have developed tasks that go well beyond retelling and engage their students in problem solving, creativity, design and judgement” (Dodge, 2001) and are now presented as a Taskonomy of approaches.
- **Use the medium** – The great advantage of using the Internet as the source of WebQuest resources is that there is potentially a vast array of multimedia material. With the development of high-speed access to the Internet and ever increasing amounts of information available it is important to try and use the up-to-the-minute material that is available. The availability of Instant Messaging, Video Conferencing and Collaboration tools also increase the benefit of using the Internet, where possible these tools should be utilised.
- **Scaffold high expectations** – In a typical WebQuest, students are asked to complete tasks which they would not normally be able to do without support. This support is referred to as scaffolding and is based on the work of Vygotsky and the Zone of Proximal Development. Dodge identifies three different types of scaffolding which will assist students to reach the objectives set in the WebQuest (Dodge, 2000).
 - **Reception** – This scaffold enables students to acquire information relevant to their study, normally this is presented to them by the teacher but as the students develop they can begin to find their own sources of information.
 - **Transformation** – Here students are assisted in reviewing the information found and they are assisted in comparing and analysing the data found.

- **Production** – This type of scaffold enables students to work from templates or previous samples so that the information gathered through their research can be presented to others for review and analysis.

By following the five FOCUS principles shown above, Dodge believed that teachers new to the idea of WebQuests could improve both their practice and knowledge through the previous experience of others (Dodge, 2001). Dodge later developed the following five-step process which can be used to assist in the design of a WebQuest (Braun, 2001; Dodge, 2001 and Hassanien, 2004):

- Select a topic which is appropriate for a WebQuest.
- Be selective in your design of the WebQuest, ensure it fits the topic.
- Describe how the students will be evaluated at the end of the WebQuest.
- Locate resources that will help students to make the most of the learning experience.
- Improve and modify your WebQuest after each run.

The following diagram (see Figure 6) shows how Dodge's FOCUS principles and the design process can be combined with the various elements of a WebQuest to provide educators with a flow diagram of the interrelationship of the various elements.

- Assess the availability of computers and access to the Internet for your students.
- Have a backup plan in case the unexpected happens.
- Maximise class time on the computer by completing off-line tasks during normal class time.
- Clarify students roles during the WebQuest and monitor student progress.
- Continue working even after the computer time is up by reviewing the material found on the Internet or planning the next steps of the study in normal class time.
- Make the assessment clear to students through the use of a rubric.
- Be excited about the possibilities, the only limitation to the use of WebQuests in education is your imagination.

2.1.7. Evaluating your WebQuest

As shown in the research of the literature on the effective characteristics of a WebQuest, our ideal WebQuest should have the interactivity, freedom, discovery and availability of the Internet. Developing a good WebQuest will enable students to work at their own pace while exploring selected areas in greater depth but still within the boundaries selected by the teacher and while still offering different, engaging and inquiry based activities which capture the interest and imagination of the students.




Unfortunately, the development of WebQuests sometimes falls short in these goals. Normally these so-called WebQuests are simple activities which require the student to simply “copy and paste” information from one website to a presentation or report without the need of the learner to ever change the information or attempt to develop an understanding of it (March, 2003). In a real WebQuest the information developed during the study is in some way transformed by the learners, a vital elements missing in Internet treasure hunts.

One of the main evaluation methods used in a WebQuest is the use of a rubric for the review of assignments. A rubric is used to “specify the qualities associated with different levels of proficiency for evaluating student assignments” (Whittaker, Salend & Duhaney, 2001). A typical rubric contains the following elements (Houston, 2000):

- It contains a scale of possible points for the scoring of work submitted.
- It provides a set of descriptors for each level of performance to enable a more reliable and unbiased scoring.
- It can be either holistic, looking at the performance as a whole. Or it can be analytic using multiple rubrics for each different element of the task.
- It may also measure the progress of the student over a period of time.

March developed an assessment rubric for teachers to evaluate their WebQuests. His rubric is focused “on what’s going on in the minds, hearts and values of the learners” (March, 2002) and is not concerned with the graphics or layout of the WebQuest being evaluated. The following rubric is taken from his site and used as a guide for teachers to self evaluate their finished WebQuests (March, 2002).

Table 2 – WebQuest Assessment Rubric (March, 2002)

	Low	Medium	High
Engaging Opening / Writing	No attempt made to appeal to learners.	Honestly attempts to appeal to student interests.	Has that something that compels attention.
The Question / Task	No real Question and / or a fuzzy Task. Maybe what's asked for is lower level thinking or info retrieval.	There is at least an implicit Question and a Task that targets higher order thinking. All this may not be totally clear.	Clear Question and Task. These naturally flow from the introduction and signal a direction for sophisticated learning.
Background for Everyone	No attempt to access prior learning or build common background.	Some mention of addressing a common body of knowledge. (May not happen within the activity.)	Clearly calls attention to the need for a common foundation of knowledge and provides needed (Web?) resources.
Roles / Expertise	No Roles / use of perspectives or Roles are artificial and may lack inherent conflict of interest.	Roles are clear and realistic. They may be limited in scope, but do evoke conflict.	Roles match the issues and resources. The roles provide multiple perspectives from which to view the topic.
Use of the Web	This activity could probably be done without the Web.	Some resources reflect features of the Web that make it particularly useful such as images, audio, interactivity, current information, etc.	Uses the Web to access at least some of the following: interactivity, multiple perspectives, multimedia, current information, etc.
Transformative Thinking	No Transformative thinking. (This is not a WebQuest, but may be a good Knowledge Hunt).	Higher level thinking is required, but the process for students may not be clear.	Higher level thinking is required to construct new meaning. Scaffolding is provided to support student achievement.
Real World Feedback	No feedback loop included.	The learning product could easily be used for authentic assessment although this may not be addressed or it only happens in the classroom.	A feedback loop connecting learners to the Real world is included in the Web page and an evaluation rubric is probably provided (early on!).
Conclusion	Minimal conclusion. No mention of student thinking or symmetry to intro.	Returns to the intro ideas. May sum up the experiences and learning that was undertaken.	Clear tie-in to the intro. Makes the students' cognitive tasks overt and suggests how this learning could transfer to other domains/issues. Probably calls attention to the assumptions / hidden agendas inherent in the WebQuest itself. Sophistication keeps increasing.
<p>Note - Values in the assessment matrix are:</p> <ul style="list-style-type: none"> • low = 1 each • medium = 2 each • high = 3 each <p>13 - 15 = </p> <p>16 - 19 = </p> <p>20 - 24 = </p>			

A list of self assessment questions were developed by Braun (2001) which enable the teacher to review their completed work.

- **How well does the WebQuest teach a particular topic?** – Will your students be able to employ the skills learnt in subsequent tasks?
- **Does the WebQuest promote collaborative learning from its participants?** – Careful attention will need to be paid to ensure the collaboration and specific roles of the group are carried out.
- **Does the WebQuest require the students to use higher order thinking skills?** – Students will be required to think critically about the information found during the study.
- **Does the WebQuest promote information literacy?** – The WebQuest should be developed so that students can follow a logical research path in the development of a solution for the task given.
- **Is the available technology used well?** – Just because you can gain access to multimedia elements such as movies and simulations does not mean they should necessarily be used. Remember, the technology is only there to assist the learning, and not the other way around.

2.1.8. Alternatives to WebQuests

In a typical WebQuest “students aim to answer questions and solve real-world problems that are relevant to both their studies and the student’s interests” (Molebash & Dodge, 2003). However, a WebQuest “should be distinguished from other web-based activities in which the final goal does not require any higher order thinking skills, these types of exercises are more suitable as concept-builders and subject samplers” (Farreny, 2006).

- **Pathfinders** – These exercises are designed to “provide a path for students to follow that focuses on their areas of research and specifically target the most appropriate resources available” (Descy, 2003) and can include references to any type of material such as books, journal, video and CD-ROM and the Internet. Descy suggests that “bookmarks are sometimes called pathfinders without a sense of direction” and can offer students the ability to surf the

Internet safely as the material being viewed was previously checked for appropriateness (Descy, 2003).

- **Scavenger Hunts** – These are sometimes referred to as “Treasure Hunts” where students use the Internet as an aid to solve a problem or answer a question within an allotted time frame. Because of the nature of the Internet students are required to spend more time finding sites and information. This type of exercise is sometimes used as a means of teaching Internet searching skills, but care is required to ensure inappropriate sites are not being visited.
- **Web Inquiry Projects** – This type of exercise is designed to address the following question posed by Molebash and Dodge (2003) “with no preset procedures and perhaps no teacher-defined questions to drive an activity, is it possible to develop an instructional model similar to WebQuests that is more open-ended?” A web inquiry project “places the emphasis back to the students to determine their own tasks, define their own procedures, and play a role in finding the needed online resources” (Molebash and Dodge, 2003). It is suggested by the research of Molebash and Dodge that the use of WebQuests is best suited to younger students as they begin to develop independent inquiry. As these students complete more and more WebQuests and their critical thinking skills develop they will need less and less scaffolding and at this stage the exercise becomes more of a web inquiry project. As in the real-world after formal education it is hoped that students can be developed that can “generate their own questions and know how to find their own answers” (Molebash and Dodge, 2003).

2.2. Hypothesis/Research Question

In many ways the development of the Internet and computing technology over the past twenty years has impacted positively on our lives and our work. The ability to convert many manual processes to computer managed processes has in many circumstances enabled us to increase our workload and productivity. The ability to digitise the majority of typical office paper-work, reports and documents has not as-of-yet lead to the “paper-less office” which has been prophesised for many years, but

it has enabled the digital storage and retrieval of vast volumes of information at the press of a button.

Nowhere can this explosion of available information be viewed better, than in the development of the Internet as a resource for the publication and research of information. In the early days of the Internet the main users of the data were colleges and academic institutions for the publication and sharing of research information. In order to publish material to the early Internet the author would be required to understand the language of the Internet, HTML (HyperText Markup Language) which was produced using simple text editors. This required level of expertise precluded most people from posting information to the Internet at the early stages of its development and therefore enabled a certain level of comfort in knowing that the information posted to the Internet was valid and relevant.

As the Internet developed in popularity among businesses and interested authors of material, the tools required to post information matured and with this more and more people developed the necessary skills to post information to the Internet. With this development of user friendly posting tools came the development of what is termed as “Web 2.0”, this is the development of a second generation of publishing tools aimed at the collaboration and sharing of information amongst social networking groups such as Bebo, online electronic diaries known as Blogs and collaborative authoring sites such as Wikipedia. These Web 2.0 tools enable anyone with basic computing skills to successfully upload and maintain sites on the Internet on almost every topic imaginable.

The idea of creating an information resource where, as suggested by Jimmy Wales the founder of Wikipedia, “every single person on the planet is given free access to the sum of all human knowledge” (Miller, 2004) does offer some serious problems for users of the Internet when using it as a tool for the research of information. Because of the ease of publication and willingness to use the Internet as a soap-box for the expression of opinions or a particular point-of-view, the Internet is full of conflicting opinions on most topics such as religion, politics and history for example.

The problem now arises where the information presented on the Internet is developing at an ever increasing rate, coming from a number of different sources without any filtering or verification before being made available to the world. This requires researchers who find information on one site to perform a critical analysis on the information presented and compare it to other similar resources before taking its opinions as reflective of the current thinking of expert scholars in these areas. It is in this need to critically analyse the information presented to students that the current problem lies.

The history of education has been developed around the traditional role of “sage on the stage” where the teacher will research relevant information, filter it and then present this to the students for consumption through rote learning. This information is then returned to the teacher in essentially the same format after being learnt by the student in order to prove it has been understood. This is a perfectly natural model for students to learn when you consider that as children this is the method by which we learn. Take for example a situation where a child is told by its parents not to touch a frying pan that it is too hot, the child will either do as instructed or they will attempt to find out for themselves and will either be burnt or chastised by the parent so that they are discouraged from questioning the adults view. It is through this repetitive approach to trusting the opinions and instructions of adults that we are encouraged not to ask questions and simply do as we are told, to do otherwise goes against our natural and evolutionary tendencies to unquestionably trust adults in authority. This type of approach to learning develops the lower levels of Bloom’s Taxonomy of the Cognitive Domain such as Knowledge, Comprehension and Application.

The explosion of information currently available to students and its difference of opinions has lead to the requirement of students to openly question the facts and figures presented to them and not take the information at face value. This requires that students are taught using a new approach, one where the teacher adopts the role of “guide on the side”. This role requires the teacher to move from a situation where they simply provide information for the student to digest to a role where the teacher acts as a guide, while the student actively engages with the material being presented and tries to develop deeper understanding of a subject based on personal experiences. This

method of teaching ensures that students are not being passively lectured, instead, they become engaged in the material being presented by being active participants. Using this approach to learning students begin to use and develop the higher levels of Bloom's Taxonomy of the Cognitive Domain such as Analysis, Synthesis and Evaluation.

Teaching students to learn material in order to fulfil the requirements of the lower levels of Bloom's Taxonomy is relatively easy and in practice this has been done for most of the history of education. The problem facing teachers today is how we can teach students the necessary skills required to progress them towards the higher levels of Bloom's Taxonomy which are required skills in an information society where access to volumes of information is at the touch of a button.

One method used to develop these necessary skills is through the use of an educational scaffold of support. The term "scaffolding" was originally developed in the late 1970's by Wood, Bruner & Ross (cited by Lipscombe, Swanson & West, 2004). It is described as a metaphor for an instructional technique where a teacher adopts the role of "guide on the side" by providing assistance in only the areas which are currently beyond the students capabilities, helping them to reach a particular goal or to complete a task which they could not complete independently. This idea of scaffolding can be summed up rather well with the following quote "effective scaffolding includes activities that help students develop the right mindset, engage students with the problem, divide activities into manageable tasks and direct students' attention to essential aspects of the learning goals" (Kgeow & Kong, 2001).

One of the key educational theories behind scaffolding is that of Lev Vygotsky's Zone of Proximal Development. Vygotsky's theory suggests that each learner has two levels of development the actual and potential development levels. Vygotsky suggested that the zone of proximal development can be viewed as the area between what a student can do themselves, the students actual development level, and what they can do with the help of peers, an adult, or as a "More Knowledgeable Other", which is considered as the students potential development level (Galloway, 2001).

From the perspective of the teacher one of the important requirements in using scaffolding as a teaching support is in the correct determination of the level of support required by the student. Too much support and the student is not challenged and may become disinterested with the exercise, too little support and the student may become frustrated with their lack of progress and eventually disinterested in continuing the exercise. As the student develops their mastery of the subject, due the support of the educational scaffold, the student should require its assistance less and less. It is important that the scaffold is gradually removed in order to ensure that the student continues to complete as much of the task under their own ability as possible (Lipscombe, Swanson & west, 2004).

It was found that simple exposure to Internet resources was not sufficient to significantly improve student learning and that simply surfing the web can lead to the loss of precious instruction time (MacGregor & Lou, 2004). A WebQuest offers a structured format which enables students to gather information and construct new knowledge and learning from it (O'Bannon, 2000).

WebQuests were first developed by Bernie Dodge and Tom March in 1995 and are defined by Dodge as “an inquiry-oriented activity in which most or all of the information used by learners is drawn from the web. WebQuests are designed to use learners’ time well, to focus on using information rather than looking for it, and to support learners’ thinking at the levels of analysis, synthesis and evaluation.” (Dodge, 1997). A WebQuest requires the students to use critical thinking and collaboration amongst other students to solve real-world problems (Erthal, 2002). This structured approach to using the Internet as a learning resource helps to focus those involved into suitable areas.

March has refined the original definition and now defines a WebQuest as “a scaffolded learning structure that uses links to essential resources on the World Wide Web and an authentic task to motivate students’ investigation of a central, open-ended question, development of individual expertise and participation in a final group process that attempts to transform newly acquired information into a more sophisticated understanding. The best WebQuests do this in a way that inspires

students to see richer thematic relationships, facilitate a contribution to the real world of learning and reflect on their own metacognitive processes” (March, 2002).

From the definitions of both Dodge and March it can be seen that the critical attribute of a WebQuest is an authentic task, relevant to the student which will act as a powerful motivator encouraging them to investigate the problem presented. This student relevant task also helps to promote a student-centred approach where students are encouraged to work collaboratively and take greater responsibility for their education. This approach to teaching helps to facilitate the transformation of information from a basic understanding to a higher-level thinking and deeper understanding as suggested by Bloom’s Taxonomy (March, 2002 and Middlebrook, 2002). This higher-level thinking is supported through the use of three types of scaffolded approaches suggested by Dodge, Reception (gathering the information), Transformation (using the information to develop new ideas) and Production (presenting the new information for approval and peer analysis) (Dodge, 2000).

The areas discussed in this section of the dissertation have been used to develop the central research question of this study which is, “Can the use of a scaffolded learning structure such as a WebQuest be used to effectively develop higher order thinking skills?” Through the research of the literature review required to develop a deep understanding of the concepts highlighted above, a number of associated questions have also been identified:

- Can Vygotsky’s Zone of Proximal Development be used to structure learning so that students have a framework of support? (Galloway, 2001)
- How can Problem Based Learning assist in developing critical thinking skills?
- What are the benefits of the higher levels of Bloom’s Taxonomy when trying to teach problem solving techniques?

The remainder of this dissertation will attempt to show how, based on the previous works of other researchers, a scaffolded learning structure such as a WebQuest can be

used to develop higher-order thinking skills. The students involved in this study are adult military learners preparing for an important career course, but the principles and procedures shown in this study can be just as easily applied to the classroom in primary, secondary and tertiary level education. The methods used to develop this study will be discussed in detail and the results of this study will be analysed for signs of higher order thinking skills.

3. Method

This section of the dissertation will provide some background information on the reasoning and importance behind developing this type of study. This section will also examine the sample used in this study and will highlight how this sample is reflective of the population being studied. A detailed description of the procedure used in this study will also be discussed detailing the various stages of the project and discussing the different data collection methods employed.

3.1. Study Background

During previous eLearning initiatives in the RDF it has been noted that the level of deep understanding of the topics presented during these courses has not increased student learning beyond simple rote learning. Students have shown the ability to apply the principles taught during these courses to standard “text-book” problems but when presented with problems requiring a deeper understanding of the issues, students struggle to develop appropriate solutions.

There is a need to develop staff that can do more than simply follow set procedures. Staff must be able to analyse a problem, relate it to the various principles taught and determine the best course of action using the appropriate method as problems are rarely simple and straight forward. There is a strong need to develop training methods which encourage students to move beyond rote learning of facts and to develop knowledge into higher order thinking which can enable students to connect, categorise and manipulate facts into new solutions (Thomas, Thorn & Small, 2000).

In this study the development of a scaffolded learning strategy such as a WebQuest is investigated to determine its level of success when trying to encourage students to

develop higher order thinking skills. During current military career courses the students are required to conduct individual study and presentations on a particular topic of interest (referred to as a “test talk”) which is closely aligned to the course objectives. For example, a Junior Command and Staff course is designed to develop the skills of command and control at Battalion level (approx 1500 personnel) of middle management officers by instructing them on various subjects such as logistics and resource management. A typical test talk in this area would require the students to review specific areas of a major battle, Operation Market-Garden, the battle for Arnhem for example, and discuss how the logistics and resource management of this battle was conducted and more importantly what lessons can be learnt and applied to today’s military operations.

There are two major problems with this current method of test talks being used to educate students in the military. The first problem relates directly to the explosion of data currently available on the Internet and through various books and journals. Due to the advances of Internet publication tools most of these major battles and campaigns have been thoroughly researched and published on the Internet. From a students perspective this is generally good news in that there are lots of available sources of information, but the problem begins with the reliability of this information as many sites have conflicting data. Additionally at least two or three students in each class are given the same subject and required to work independently, this helps to students to share information among classmates. From the instructors perspective the problem is that of plagiarism, accidental or on purpose. As a result of the development of Wikipedia and similar sites, most of the information required is available in one repository and does not require the students to conduct independent research and evaluation of information. An additional problem of students copying data from each other is also difficult to prove, however because students are doing the exact same project and generally using the same resources a certain amount of duplication is expected.

The second issue in relation to the current usage of test talks in the military is loss of this research after each course. Essentially the presentations and research conducted by each class are not stored for further research or publication. To students, this

makes the whole process of research for these test talks, and the effort required to develop the presentations an unworthy use of their time. Therefore the students are more inclined to take the easy option of “copy, cut and paste” from currently available material.

A better solution to this type of study method is through the development of a group WebQuest where students are required to collaborate as small groups in the development of a final product and where the various groups are designed to combine with the other groups to develop a larger body of research. The design of the WebQuest could follow along the lines of the chapters of a book, where each group of students are required to develop a specific section. This initial research would fulfil the role of the initial “background for all” stage of a WebQuest for each group. When this has been finished the students would be required to answer an open ended question relating to this section and to develop a solution which requires them to transform the research developed to more sophisticated understanding of the topic being learnt. When each group has completed their work it can be compiled to form a larger piece of research which would be stored or published and used by future students as research material.

This is the general approach taken in this study; students are first required to develop an individual foundation WebQuest which fulfils the “background for all” requirement. Then students are placed into small groups and required to research a second group WebQuest and apply the lessons learnt specifically to the Irish RDF. This second part of the group WebQuest has no existing material previously written. Therefore the work requires students to apply critical thinking skills to develop their final solutions to this task. It is hoped, with the approval of the students, that this research material will be submitted for publication in both the Irish Defence Forces magazine “An Cosantóir” and website.

3.2. The Sample

The sample used for this study was taken from a group of Non-Commissioned Officers (NCOs), approximately 25 students who are currently undergoing an Officer promotion course. These students have already completed one year of a two year training course to promote them into the Commissioned Officer ranks (junior management). This course was particularly chosen because as Officers these soldiers are required to develop critical thinking skills, to critically analyse situations and use skills developed in problem based learning exercises to develop and evaluate courses of action. At this level of the military students are expected to use their initiative and be constructive in their problem solving abilities. A WebQuest would offer a good foundation in the development of these necessary skills.

Initially these students were to be informed that they would be required to complete this study as part of their promotional course but this was later changed requiring only those who volunteered to conduct the study. The students were approached in January 2007 and given an overview of the subject, their role in the study, the duration of the study and their participation requirements. At the end of this overview the following students agreed to participate (see Table 3 and Table 4):

Table 3 – Gender breakdown of students.

<i>Gender</i>	Male	Female	Total
<i>Number</i>	6	3	9

Table 4 – Age breakdown of students.

<i>Age bracket</i>	21-25 years	26-30 years	31-35 years	Total
<i>Number</i>	2	5	2	9

These students came from a number of different units and military trades; with various levels of prior training and educational backgrounds before coming onto the Potential Officers course. Although this group is a convenience sample, the various

levels of training and prior education helped to ensure a random selection of test subjects and their skills levels and gave a representation of the overall population.

In the initial WebQuest the students would be required to work individually after which the subjects were randomly assigned to a small test groups, three people each, and given the facilities to collaborate online during their group project.

3.3. The Procedure

The subjects being studied are on an important career course within the Defence Forces, preparing them for management roles within the organisation. The students' final placement on this promotional course determines the allocation of their new unique Officer number. This number is used to determine seniority among officers of similar rank and is one of the determining factors for later career promotions when applicants are of equal experience and completed courses. Therefore, to subject them to a traditional experiment using a control group and experimental group would be unethical as the process of the study would unfairly affect the performance of the control group and ultimately affect the future promotional prospect of the students in this group within the Defence Forces.

As a result of this issue, the design for this study was based on a flexible research design strategy and in particular a case study where a detailed empirical investigation of the topic was reviewed and documented using multiple sources of data collection both quantitative and qualitative (Robson, 2002). Using this approach enabled the students to receive the exact same stimulus as all others on the course and helped to ensure that no individuals or groups were given an unfair advantaged over any others.

3.3.1. Research Design

The measurement and analysis for this study was through a number of means both quantitative (through the use of an assessment rubric) and qualitative (through the comparison of a pre-study and post-study survey and informal interviews). The data was analysed at each stage of the study enabling not only a local analysis, i.e. analysing all the individual WebQuests against each other, but each stage was also analysed against each other to identify any trends or issues. For example, the

individual WebQuest results were compared against the group WebQuest results to determine if any noticeable improvement was apparent. The data obtained was later generalised so that it could be successfully applied into other topics and situations both inside and outside of the military.

3.3.2. Stage 1 – Pre-Study Survey

The first stage of the project required students to submit an individual survey to determine their perceived level of the current usage of technology in support of training which is currently being used by the organisation (*see Annex A*). The role of this pre-study survey was to determine a snap-shot of current trends from which a post-study survey will be compared against later. The survey would also allow the analysis of the current method of Test Talks to be compared against the use of WebQuests.

This first survey was designed to capture general information from the students such as age, gender etc. The students were also questioned on their current preference to working on assignments. This question would later be used in the second survey to determine if any noticeable change had occurred in this preference. It was hoped that a positive change occurred which would indicate that after completing the group WebQuest the students had now developed a preference to group work.

The next portion of the survey questioned the users on their current computer configuration asking about the different types of devices used by the student, their operating systems and information on the student's connection method to the Internet. This type of user information, although not critical for this study, is valuable for future work as it allows the developers in the RDF eLearning section to determine the direction for future development of eLearning projects.

In order to develop a sense of IT literacy within the group two sets of questions were developed, the first set of questions was aimed at determining the amount of time users allocated to general PC usage. The second question asked users to rank their perceived ability using a number of different software tools.

The next group of questions in this survey were related to the use of learning technologies that students had used outside of the military and asked them to evaluate their successfulness as a training tool. This entire section of the questionnaire was designed to be used in the second survey and the results from this would be compared to the results of the second survey in order to determine if any noticeable changes were apparent. This section began with asking the students for their preference with regard to the use of technology and tried to assess if students had a preference for the traditional classroom delivery, an online delivery preference or a blended preference of eLearning delivery supplemented by face-to-face training.

This portion of the survey also questioned the students on their opinions of the effectiveness of online delivery. Students were asked about the use of technology in the classroom and whether or not this usage had any effect on their interest for the subject being taught. This section also asked students to consider the impact of eLearning in relation to communications both from the perspective of the students to other students and to the teachers. As the students on this course were geographically separated the development of an online community would become important and the use of communications especially in relation to the group project would become very important to the success of the various groups.

The next section of the survey was designed to assess the level of learning technology which is currently being employed in the Defence Forces. As NCO's each of these students is a qualified instructor in their particular field with many years of experience as both an instructor and as a student, therefore their feedback on this section would prove very useful when developing future eLearning courses for the RDF.

The first question asked students about their experience using a Learning Management System (LMS) such as BlackBoard or Moodle. The BlackBoard LMS has been purchased by the Defence Forces around 2003 for the development and delivery of eLearning course for the Defence Forces. From a RDF perspective the use of BlackBoard is a welcome development to eLearning in the Defence Forces. A number of security implications prevent the roll out of this system for the RDF, in particular the inability to access the training material via the Internet. Currently the

Defence Forces BlackBoard system resides within a secure Local Area Network (LAN) which prohibits external access to content, in other words, for RDF personnel to access this resource they must be in a military camp and logged onto a designated military computer.

In order to get around this security issue the RDF Training Authority has developed a sample Moodle LMS site for the delivery of online content. This Moodle website was used as the communications vehicle for this study and offered an ability to test the usefulness of the system and provide valuable feedback for its future development. Students were asked to rate their experience of using an LMS and this was later compared to the results from the second survey to determine if there was any noticeable difference in opinions.

This section of the survey continued by asking students about their preference for the receipt of training material for future courses, such as printed study books, online material, through a traditional classroom setting or a blend of these methods. Over the past two years the RDF has developed a number of CD based training packages which are primarily PowerPoint presentations delivered through a web-based interface. These CD's have proved a general success, proving a valuable resource for students after the course has finished. The purpose of these questions being included in this survey is to confirm this previously stated preference for CD based material but also to use this as a measure of the student's preference after they have completed the web-based portion of the study and how that method of delivery may impact on their choice of training material format.

The last section of this survey was aimed at determining the student's current opinions of higher order thinking and its value to the Defence Forces. Again, the information gathered here would be used as a measure to compare the results of the second survey at the end of the study (see Stage 4).

3.3.3. Stage 2 – Individual WebQuest

After students had completed their pre-study survey the individual WebQuest could begin. Although the students had previously received a brief overview of the purpose

of the study, the opportunity was taken to further explain the format of the study. The introduction explained in detail what a WebQuest was, how it works, its advantages and disadvantages and finally looked at this particular WebQuest and discussed how it would be conducted over the following weeks. It was hoped that by exposing the students to the importance of the study and their participation, they would feel less likely to drop out of the study. The training programme for the day can be seen in Figure 7 below.

Training Programme		RDFTA – Potential Officer Course 2007		Sun 11 February, 2007	
Time	Subject	Dur	Location	Instructor	Remarks
09:00	Parade and inspection	–			
09:15	Introduction to the study: Purpose of the study, how it can affect your level of training and an introduction to WebQuest – how they work and their advantages.	45	RDFTA	Lt Lally	General intro to the study
10:00	Movie: Occupation Dreamland – Setting the stage for the study by developing a common foundation.	60	RDFTA	Lt Lally	
11:00	Break	15		Ord. Sgt	
11:15	Continuation of movie and student led discussion on issues raised from the movie	75	RDFTA	Lt Lally	
12:30	Lunch	60		Ord. Sgt	
14:00	Assignment of study groups and an introduction to systems used for the collaboration and communications during the study. Practice period using laptops and online software.	45	RDFTA	Lt Lally	Laptops required pre-loaded
14:45	Handout of assignments including discussion of deliverables	45	RDFTA	Lt Lally	
15:30	Questions from students about the study and its deliverables, dates due etc.	30	RDFTA	Lt Lally	
16:00	Parade and Dismissal	–			

Submitted by _____ Instructor (Lt J Lally)

Approved By _____ O/C RDFTA (Lt Col M. Farragher)

Notes:

- Please note this is a draft programme and will need to be agreed with the Comd J. Meally as the Course U/C.
- The movie shown is simply to create a foundation of knowledge on the specific topic being studied; the title may change if a more appropriate movie is found.
- The practical period is designed to allow students the opportunity to use the on-line software needed for the study while also having IT support available.

Figure 7 – Training Programme for the Individual WebQuest (11th February, 2007).

The first stage of a WebQuest is the Introduction stage; it is here that the instructor attempts to hook the students into the topic being discussed by setting the scene for the remainder of the WebQuest and providing background information relevant to the task (Dodge, 1997). This WebQuest was designed to capture the interest of the students by providing them with an authentic, open-ended task which would hopefully catch their interest and attention.

It was decided to focus on the current Iraq conflict as the main topic for this WebQuest and in particular the battle for Fallujah in 2004. A typical WebQuest will use role-play as a means of motivating the students while completing the WebQuest assignments. In this WebQuest students would be required to take on the role of a

United States Reserve Officer serving in Iraq. The fact that the role the students were asked to play is similar to the role that they would soon be fulfilling as Officers in the RDF was specifically chosen so that it would make the task feel more realistic. Furthermore, there have been a number of discussions conducted within the military over the past few years discussing the possibility of having members of the RDF serving in appointments on overseas missions.

In order to provide the necessary background for the students they were shown a documentary called "Operation Dreamland" where a film crew follows a unit of the 82nd Airborne as they patrol in Fallujah. The documentary discusses why these men first enlisted into the military, what their civilian prospects are if they leave and their feelings about the war and Iraq. The documentary is designed to not hold back with various criticisms of the US military and government policy as applied to Iraq and allowed the students to get a very frank and realistic view of the war in Iraq from a soldier's perspective. Following this documentary the students participated in a general discussion on the movie and were encouraged to relate what they had seen to an Irish context. Having completed this exercise the students were now in a better position to adopt the role of serving soldier in the Iraq war.

The students were given the following task to complete as part of their WebQuest: "Your task will be to conduct a detailed review of the battle for Fallujah and the suspected war crimes during this operation in order to highlight valuable lessons from this conflict which can be used to highlight for your Platoon the difficulties of operating in Iraq." The Fallujah conflict was (to date) one of the bloodiest in the Iraq conflict and as such had managed to gain a substantial presence on the Internet so there was not a shortage of relevant information including movies, articles etc.

As part of the scaffolding structure in order to help the students to complete this task they were required to prepare a presentation on the battle of Fallujah under the following areas:

- Develop a timeline of events and a detailed review for the battle of Fallujah in both Operation “Vigilant Resolve” and Operation “Phantom Fury” including maps, causality reports and any other items of interest.
- A number of high profile suspected war crimes have been uncovered during this and similar battles in Iraq. Discuss some of the steps which you as a Platoon Commander can take to ensure that the men under your command do not make these same mistakes.

This first task required the students to research the resources presented to them as part of the WebQuest and gather the basic information of the battle. The second task required the students to transform this information previously obtained into a new and more sophisticated understanding of the issues raised and using this new understanding to develop a final product showing that this transformation had occurred.

The submitted assignments are marked against a rubric designed to facilitate both the individual and group WebQuests. Rubrics are used to assess the submitted assignments because they help to make the expectations of the teacher clearer and also offer the students targets to achieve (Whittaker, Salend & Duhaney, 2001). The rubric was generated following the suggested three stage format of Dodge (1999), which gave a framework for assessments as shown in Table 5.

Table 5 – Example of a rubric template suggested by Dodge (1999).

	Beginning	Developing	Accomplished	Exemplary	Score
<i>Stated Objective or Performance</i>	Description of identifiable performance characteristics reflecting a beginning level of performance.	Description of identifiable performance characteristics reflecting development and movement toward mastery of performance.	Description of identifiable performance characteristics reflecting mastery of performance.	Description of performance characteristics reflecting the highest level of performance.	

The full rubric was sub-divided into five elements (Mechanical, Multimedia Elements, Quality of Content, Group Collaboration and PowerPoint Submission), the first four were used in the group WebQuest. This individual WebQuest rubric was further divided into, Introduction, Content, Text Elements, Layout and Graphics, Sound and Animation (see Annex B for full details).

In order to signify the importance of certain areas within the rubric a weighting system was also incorporated, this allowed students to easily identify those areas which were of particular importance in the assignment. This entire rubric was made available to the students at the beginning of the study and was discussed in detail as to how it would be used by both students and instructor to gauge the performance of the submitted assignments.

3.3.4. Stage 3 – Group WebQuest

The students used for this study came from a number of different locations throughout the country and facilitating group work would have become very difficult without the use of an Internet based collaboration tool. In this case the use of Moodle was considered an appropriate tool because of its available features such as discussion forums, chat rooms, private messaging and the use of Wikis. All of these tools would

be made available to the students and in particular the use of discussion forums and group Wikis would play an important role.

From the results of the pre-survey and the discussions held during the training day it was found that only six of the nine available students had ever used an LMS with various levels of usage within that six. It was decided prior to the beginning of the study that this may prove a hurdle for students who may not be very technically minded. Therefore, a training session specifically designed to introduce the students to the use of Moodle would be developed, this training session would prove itself as a valuable step later in the study by reducing the amount of technical support calls from students which was expected. This training session included information on how to:

- Log-in and Log-out.
- Read and post forum messages.
- Send and receive private messages.
- Create, edit and delete Wiki pages.

Initially the students were placed into random groups and introduced to each other during this training session, it was later considered that in the event of students dropping out of the study this might not have been advisable, thankfully this concern proved un-necessary as all students completed the study. At the successful completion of the individual WebQuest the students were randomly assigned to three groups of three students each. They were asked to make communications with the other members of their group to begin the planning of the group WebQuest.

Building from the individual WebQuest and the background developed on the training day the group WebQuest was again focused on the Iraq war and the use of Reserve units. In this WebQuest the students were required to adopt the role of a member of the RDF who has been assigned to a working board tasked with the development of a report investigating the potential issues for the RDF serving overseas. The task given to them required them to “Summarise the problems faced by reserve members serving

in Iraq and formulate preventative measures to ensure these problems do not arise when the RDF serve overseas.” Again, as in the individual WebQuest this is currently a topical issue in the Defence Forces and should therefore grab the attention of the students.

The students were given the necessary resources to gather the basic information required to evaluate the problems that are currently being faced by members of the US Reserve forces. However, the second part of the task would not be found anywhere on the Internet and would require the students to critically analyse the data gathered and evaluate its effects on the current structure and attendance requirements of the RDF. To help the students prepare this information the following scaffolded support through the use of the WebQuest process was given to them:

- In particular, discuss the level of preparation training for such missions and the effect of prolonged overseas deployment on families, employment and general recruiting.
- Based on the current training in the reserve, what lessons can be applied to the RDF before any future overseas postings are made available to the RDF.
- What suggested improvements and additional training will be required for a Company of reservists to be made available for an overseas peacekeeping operation such as KFOR (Kosovo Force).
- Aim to develop a 3000-5000 word report as a guide.

As in the individual WebQuest, the submitted assignments were marked against a rubric designed to facilitate both the individual and group WebQuests. In this WebQuest the students were required to use the group Wiki as the delivery method for the assignment. Using this format of delivery required the use of the remaining four elements of the original rubric (Mechanical, Multimedia Elements, Quality of Content and Group Collaboration), which enabled the students to clearly see the standard required of the submitted work (see Annex B for full details).

A weighting system was also incorporated this allowed students to easily identify those areas which were of particular importance in the assignment. This rubric was made available to the students at the beginning of the study and was discussed in detail on how it would be used by both students and instructor to gauge the performance of the submitted assignments.

During the analysis of the group collaboration it was envisioned that the initial responses on the discussion boards at the early stages of the study will be at a low level of critical thinking but as the study develops responses should increase to show signs of critical thinking going from an "I agree" type post to posts applying learned content and then even to posts which show obvious synthesis of learned content. The analysis of the study would attempt to highlight this progression of critical thinking on the discussion boards.

3.3.5. Stage 4 – Post-Study Survey and Interview

A second survey (post-study survey) was presented to the students after the successful completion of the group WebQuest. This survey was generally based on the pre-study survey and included the general areas of the use of technology for learning, the use of this type of technology for military training and the development of higher order thinking skills in the Defence Forces. As with the original pre-study survey, some of the questions included in this survey were of general feedback on the development of eLearning in the RDF.

The results from both surveys were then brought together and in the analysis of the data, it was attempted to determine what changes in the student's initial understanding of the subject and their impressions of the value and use of technology had changed during the course of the study. Based on these results a series of interview questions were developed which would enable any peculiarities in the research finding to be discussed with the students.

Due to time constraints only two interviews were conducted, these were held three weeks after the course via telephone in order to gather further information and clarification based on the results found during the analysis phase of the study. The

interviews were designed to be informal discussions on the student's opinions of the course, its strengths and its weaknesses. The students were assured that the feedback given would remain confidential and were therefore encouraged to provide honest feedback. Each of these interviews lasted ten to fifteen minutes in duration and although these interviews did not provide any major discoveries in relation to the data gathered in the study, they did, as noted by one of the students, provide a certain level of closure to the study as noted by one of the students.

Although initially it was hoped to have in the region of fifteen to twenty students complete the study only nine students made themselves available. Given the low number of students the results generated in the following section may not be a true reflection of the total population. All data received was entered into Microsoft Excel for data analysis, the quantitative results will be presented in the next section. These results will also include relevant qualitative data which was gathered through the various open-ended questions in the survey and from the informal interviews conducted. It is fully recognised that these responses are subjective and biased from the perspective of the student, but they can be useful indicators of unforeseen issues not covered in the survey.

4. Results

During the WebQuest study the students were given two separate surveys to complete, one at the beginning before the study began which was used to evaluate the students current thinking in relation to study, the use of IT and critical thinking. The second survey was given to the students after the study had finished, this was designed to assess the changes which had occurred to the students during the course of the study.

Each survey contained additional questions which were developed to gather further information useful to the RDF for the design and development of additional courses. There were twenty two core questions which given to the students at each survey, the results and an explanation of these results will be presented here. Where required, the explanation of the results will be supplemented with information gathered through informal interviews which were conducted after the initial review of the data.

On the initially analysis of the results presented in Figure 18, it was disappointing to find that the marks from the post-study survey were actually worse off after the study was completed. However, on further analysis of these results it was found that these results should have been expected.

When most people in the military think of a computerised course they are automatically led to consider some form of simulation such as a first-person-shooter or an aircraft simulator and although these types of simulators are educational they are based on gaming theory. For example, the commercial game Operation Flashpoint is the bases of the military simulator Virtual Battle Space 1 (VBS1) which is used by the US Marine Corps and the Australian Defence Force (www.virtualbattlespace.com).

These types of games enable the user to practice and develop the necessary skills required to progress to the next level of training. The participation of a WebQuest does not offer this type of practice and rehearsal. Once the objective is met there is no need to try the task again from the beginning, in other words there is very little value in having the same students repeat the same WebQuest as the information being researched will not change substantially and therefore the submitted work would also remain generally the same each time. The information gathered by the students and the WebQuest itself can be used time and time again unchanged if required, but only with new students each time.

method would bring when trying to encourage students to develop higher order thinking skills.

These higher order thinking skills are becoming more and more necessary in the modern society which bombards us with information overload and where problems are rarely simple and straight forward. There is a strong need to develop training methods which encourage students to move beyond rote learning and develop higher order thinking skills such that principles learnt in the traditional manner can be concurrently applied to multiple areas and to solving non linear problems.

The literature review has shown that traditional teaching methods have relied on the principle of the transmission of knowledge from teacher to student through word of mouth. With the availability of online material there is recognition that teachers are now required to think more creatively on how they may employ these vast information sources. The challenge for education is to determine the best ways of integrating current Information Communications and Technology (ICT) into our classrooms so that it may enhance the transfer of knowledge (Reid, Labonne & Gibsob, 2001). The traditional role of “sage on the stage” also needs to be transferred to “guide on the side”, this ensures that students are not passively being lectured but that they become engaged in the material by being active participants in their own learning (Al-Bataineh et al, 2000).

The WebQuest was developed by Bernie Dodge and Tom March as “an inquiry-oriented activity on which most of all of the information used by the learners is drawn from the web” (Dodge, 1997). The purpose of the WebQuest is to try and make the best use of the students and instructors time by allowing them to spend time on using information presented to them rather than spending time searching for it. This approach of using the information rather than searching for it encourages students to use the majority of their time developing the higher order skills of analysis, synthesis and evaluation.

The development of WebQuests is strongly influenced by the work of Vygotsky and his work on the Zone of Proximal Development and Scaffolded Learning. Vygotsky

suggested that students can achieve greater success in achieving an objective if they are offered some support in the areas where they are currently not knowledgeable. The key to this scaffolded assistance is that the student is only offered minimum support to enable them to achieve the objective. Over time as the student improves and develops the necessary skills this support is slowly removed away.

This study followed the general principles of the development of a WebQuest suggested by Dodge and March, and provided just enough scaffolded support to encourage students to become engaged in the topic through the analysis and evaluation of the material presented without having to become bogged down in the research behind finding appropriate websites.

The analysis of the project results indicated that although initially students felt that they preferred to study and work on projects individually, by the end of the study the vast majority of the students had shifted in their original opinion and now felt that the ability to discuss problems within a group was beneficial when problem solving. However there was a problem with the ability to effectively communicate via the Internet through the use of discussion forums and chat, which will be discussed later in this section.

Students were also of the opinion that the use of the Internet as the main delivery tool offered them a much greater level of control over their own learning. Using this delivery method, students could study in both the location and time of their choosing once there was an active Internet connection. This approach to learning has been recently developed in the RDF through the use of CD's but currently there are not many courses designed in this format and the students on this study would not have had access to these.

An important point suggested by a student was that the reliance of the Internet should not be allowed to create a technology elite class. Put simply, this student suggested that the technology used to deliver and administer any eLearning developed by the Defence Forces should be aimed at the lowest common denominator i.e. those with 56k dial-up and slow PC's. This is a valid point and sometimes in the rush to develop

new material using multimedia and state of the art development tools it is easy to forget that not everyone has the availability of broadband and fast processing speeds.

The results from the analysis of both the individual and group WebQuests did offer some interesting findings. In the individual WebQuest it was discovered that of the nine participants there was only a maximum deviation from the highest and lowest score of approximately 10% from the average score which was 62.91%, this would indicate that the results gathered were both valid and reliable. When the analysis of the group WebQuest was conducted it was discovered that of the three groups involved there was a maximum deviation from the highest and lowest score of approximately 8% from the average score which was 83.83%. This gave the group WebQuest an increase, on average, of 20.92% in the assessment scores. This result would indicate that through the use of collaboration amongst the students of each group the group WebQuest offers an increased level of learning to the students.

Unfortunately however, because of the small number of groups used in the second WebQuest it is difficult to conclusively stand over these apparently successful results. The original project proposal requested the use of between 20 and 25 students which would have offered between seven and eight groups for the second WebQuest; but due to internal issues this was not to be the case. However, it is my opinion that these results do still offer a positive trend in the use of group WebQuests over the use of individual WebQuests, but it is also fully recognised that further investigation and analysis is required to confirm this finding.

An interesting negative finding from the study was the use of technology for the provision of communications between the students and the instructor and between students in each group. The issue of communications with the RDF is difficult at most times due to the extended locations of units and individuals. The majority of communications to RDF members is conducted via phone conversations as email and text have been suggested as inappropriate for the passage of sensitive information. From the student/instructor perspective this means that effective communications can only take place outside of normal working hours for most people, and this can build in a delay message delivery. The use of an online web-based system such as Moodle or

the Defence Forces BlackBoard LMS could be used to alleviate this issue through the use of discussion boards. For a student it can be difficult during normal office hours to take time to attend to an RDF problem, but it is relatively easy to log-in and post or review a topic on a discussion forum. If the forum has the ability to email to the relevant parties when it is updated this also greatly increases the chances of developing an effective communications network.

The second negative finding in relation to communications was the ability for students to communicate effectively when collaborating using the Internet tools available. At the interview stage of the project it was pointed out that the method used for collaboration at the initial stage of the project was through the use of the discussion forums provided on the site. But as the discussion needed to progress the students found that the lack of real-time discussion actually became a hindrance to developing a deeper understanding of the subject.

This led most of the groups to adopt a system where their initial discussions about the project such as the issue of tasks and report updates were conducted via the Moodle discussion forums. However, when a serious debate was required by the group the students would simply telephone each other in order to get a quick answer to an issue.

The use of the Moodle LCMS does not currently permit the use of voice communications software such as Skype. However, a suitable solution using a third-party web conference piece of software called "iVocalize Web Conference", has been located. This system allows for the traditional features of a chat board but also included with this package is the extra ability to send voice data.

The user can type messages as normal and when required they can use their microphone to send sound message also. This system also enables users to record the conversations (both text and sound) if required for future. This is a system which will be investigated further, but the initial use of this system on a discussion board shows favourable results.

6. Future Perspectives

The apparent success of this study, suggesting that the use of WebQuests can aid in the development of higher order thinking skills of students, indicates a number of short-term and long-term future development directions.

The most apparent short-term suggestion for this type of study is to gather further data in order to substantiate the findings presented. It has been acknowledged in this dissertation that the relatively small numbers of students used in this study can have an effect on the final results. In order to confirm or deny these initial findings it would be suggested that the next Potential Officer course be required to participate in this exact same study. The results of this second group could then be individually analysed as was done in this particular study, and then compared against the original findings here. This would enable a more accurate determination of the success or failure of this project.

From the feedback gathered through both informal and formal channels, the students seem to have become interested in this type of training method. The original idea for this project was built on a more holistic approach to the subject. In this original draft the students were required to complete the research portion of the assignment in a similar fashion to this study. Built on to this original version of the WebQuest would have been the practical application of various problem solving military skills.

For example, in reviewing the battle for Fallujah the students would be required to produce the same assignment as was done in this study. However, they would then be required to split into two main groups. The first main group would further split into a number of separate groups and develop an appropriate plan for the assault of Fallujah (playing the role of the US military) along with all the necessary operational orders developed and battle plans drawn. The second major group would again be split up into smaller group and be required to adopt the role of the insurgents to develop plans for the defence of Fallujah. Each major group would be required to develop a consensus of opinions for their task and present this consensus to the opposing group who would critically analyse it in an entire class face-to-face discussion.

Using this type of assignment, the theory that the students have learnt during their research at the initial stages of the WebQuest can be used in a practical sense. Students will be able to develop a greater appreciation of the problems faced by each side through the use of role-play and bringing external skills such as the development and delivery of operational orders helps to add realism to the exercise.

The development of military planning is effectively an exercise in traditional problem solving, using the WebQuest style of learning can be a very effective tool in this development. The initial problem research and collaborative nature of the WebQuest can be used to supplement existing training methods into a solid framework which require students to adopt the higher order thinking skills suggested by Bloom's Taxonomy. Using this approach, students can develop their own personal skills and expertise through the use of group collaboration and the expertise of the other members of the group. In a time where budgets and training time are becoming more and more limited, this type of paper training exercise has the same effect, from the command perspective, as the live exercise but without the administrative overhead of the required logistics to run such an exercise.

This type of approach is not new to the military as they have used for many years a type of paper based exercise called a Tactical Exercise Without Troops (TEWT), the main difference using the WebQuest format for this type of exercise is the use of collaboration amongst the various students to develop an appropriate solution.

If the Defence Forces are serious in developing a military in which its leaders can perform an independent critical analysis and evaluation of a situation when serving overseas or on operational duties, there needs to be a framework of training developed which can accommodate this type of training. The WebQuest framework offers a suitable approach to the development of higher order thinking skills which can be used equally successfully in either the education sector or in military training.

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8. Appendices

8.1. Appendix A: Pre-Study Survey

8.1.1. Sample of pre-study survey

MSc LT - WebQuest Questionnaire (Pre-Course).doc

Created by Lt John Lally



MSc Learning Technologies WebQuest Questionnaire – Pre-Course

**To ensure improvement for future courses please
complete this feedback form. DO NOT mark this form with
your name or number.**

Instructions:

The purpose of this survey is to help develop an understanding of your current IT setup and any preconceived ideas of eLearning you may have arriving on the course.

Please complete this questionnaire answering the questions as accurately as possible. We are interested in your honest answers both positive and negative. Please answer ALL of the relevant questions; all information provided will remain CONFIDENTIAL. Your carefully considered responses will help to improve the way eLearning is presented in the future.

Please tick your response to the items presented. Rate aspects of the module on a scale of 1 to 5 where 1 = "Strongly Disagree" and 5 = "Strongly Agree". Choose "N/A" if the question is not appropriate or not applicable to you. Your feedback is sincerely appreciated. Thank you.

Introduction:

Q1. What is your gender? Male Female

Q2. What is your age group? <20 21-25 26-30 31-35 36-40 40+

Q3. Which of the following statements best describes you?

- I learn best when working alone and thinking through problems and concepts myself.
- I learn better when working alone in some situations.
- I learn equally well when working alone and when discussing concepts and problems with others.
- I learn better when discussing concepts and problems with others in some situations.
- I learn best when collaborating with others and discussing concepts and problems with them.

Q4. Which of the following devices do you own? Check all that apply.

- Desktop Computer.
- Laptop Computer.
- Personal Digital Assistant (PDA).
- Mobile Phone.
- Smart Phone (combination of mobile phone and PDA device).

Q5. What operating system do you frequently use? Check all that apply.

- Windows 98 or ME.
- Windows 2000.
- Windows XP.
- Mac OS 9.
- Mac OS X.
- Linux (Ubuntu, Red Hat, Fedora, Mandrake etc.)
- Not sure.

MSc LT - WebQuest Questionnaire (Pre-Course).doc

Created by Lt John Lally

- | | | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Q18. Image and Graphic software. | N/A | 1 | 2 | 3 | 4 | 5 |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Q19. Creating and editing audio. | N/A | 1 | 2 | 3 | 4 | 5 |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Q20. Creating and editing video. | N/A | 1 | 2 | 3 | 4 | 5 |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Q21. Creating and editing web pages. | N/A | 1 | 2 | 3 | 4 | 5 |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Q22. Course management systems
(BlackBoard, WebCT, Moodle etc.). | N/A | 1 | 2 | 3 | 4 | 5 |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Q23. Online library resources. | N/A | 1 | 2 | 3 | 4 | 5 |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Q24. How do you normally connect to the Internet?

- Home Dial-up modem.
- Company Dial-up modem.
- Home Broadband.
- Company Broadband.
- College/University Broadband.
- Wireless Network.

The use of technology in learning (general – non-military):

- Q25. Which of the following best describes your preference with regard to the use of technology?
- I prefer taking classes that use no information technology.
 - I prefer taking classes that use limited technology features (PowerPoint presentations).
 - I prefer taking classes that use moderate level of technology (email, presentations, some online activity).
 - I prefer taking classes that use technology extensively (online lecture notes, computer simulations, live video/audio).
 - I prefer taking classes that are delivered entirely online.

MSc LT - WebQuest Questionnaire (Pre-Course).doc

Created by Lt John Lally

N/A = Not Applicable, 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree Nor Disagree,
4 = Agree, 5 = Strongly Agree

- Q26. I spend more time engaged in course activities in those courses that require me to use technology. N/A 1 2 3 4 5
- Q27. The use of technology in my classes meets my expectations. N/A 1 2 3 4 5
- Q28. The instructor's use of technology in my classes can increase my interest in the subject matter. N/A 1 2 3 4 5
- Q29. I find that I get better grades in courses that use IT. N/A 1 2 3 4 5
- Q30. The use of IT in class helps me better understand complex or abstract concepts. N/A 1 2 3 4 5
- Q31. The use of IT on courses helps me better communicate with the instructor. N/A 1 2 3 4 5
- Q32. The use of IT on courses has resulted in prompt feedback from my instructors. N/A 1 2 3 4 5
- Q33. The use of IT on courses helps me communicate and collaborate with my classmates. N/A 1 2 3 4 5
- Q34. The use of IT on courses provides more opportunities for practice and lesson reinforcement. N/A 1 2 3 4 5
- Q35. Classes that use IT allow me to take greater control in my class activities (e.g. planning, studying etc.). N/A 1 2 3 4 5

The use of technology in learning (military):

Q36. Have you taken a class that has used a course management system such as Blackboard, WebCT or Moodle before? Yes No

N/A = Not Applicable; 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree Nor Disagree; 4 = Agree; 5 = Strongly Agree

Q37. Overall, I enjoyed the experience using a course management system. N/A 1 2 3 4 5

Q38. Would you be willing to use a learning management system for future courses? Yes No

Q39. What are the barriers for you (if any) to using a computer or IT in your class work? Check all that apply.

- It feels like extra work with little connection to the course.
- I don't have the necessary skills.
- I don't have the technical support required.
- It's too expensive.
- I don't have sufficient access to a computer.
- I don't have sufficient access to a printer.
- The applications don't run on my computer.
- I don't have a reliable or sufficient access to the Internet.
- There are no barriers.
- Other (please explain)

Q40. Do you have access to the Defence Forces Intranet from your sub-units HQ? Yes No

Q41. In your opinion what are the obstacles currently affecting the expansion and use of eLearning in the Reserve Defence Forces? Check all that apply.

- Lack of hardware.
- Lack of software.
- Lack of Intranet connection.
- Inadequate information about the use of technology.
- Lack of adequate training for instructors and students.
- Student and instructor resistance to using IT
- Concerns over security.
- Other (please explain)

Q42. How would you most like to receive training material for future courses?

- Printed notes.
- Online.
- Initially online but followed with a traditional class to reinforce the material.
- In a traditional classroom.
- Other (please explain)

Q43. How would you least like to receive training material for future courses?

- Printed notes.
- Online.
- Initially online but followed with a traditional class to reinforce the material.
- In a traditional classroom.
- Other (please explain)

N/A = Not Applicable; 1 = Very infrequently; 2 = Infrequently; 3 = Rarely;
4 = Frequently; 5 = Very Frequently

Q44. As a student how frequently are you presented with an IT solution for the delivery of learning? N/A 1 2 3 4 5

Q45. As an instructor how frequently are you presented with an IT solution for the delivery of learning? N/A 1 2 3 4 5

Development of higher order thinking skills:

N/A = Not Applicable; 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree Nor Disagree;
4 = Agree; 5 = Strongly Agree

Q46. I believe I am capable of conducting effective research on a given topic. N/A 1 2 3 4 5

Q47. I believe I am capable of analysing information and identifying its key components. N/A 1 2 3 4 5

N/A = Not Applicable; 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree Nor Disagree;
4 = Agree; 5 = Strongly Agree

Q48. I believe there is value in developing higher order thinking skills in the military? N/A 1 2 3 4 5

Q49. At what level of training should higher order thinking skills be taught to students?

- Private.
- Junior NCO.
- Senior NCO.
- Junior Officer.
- Senior Officer.

Q50. If given the option of individual or group study for a project which would you prefer? Individual Group

Q51. Please explain why you selected that option?

N/A = No; Applicable; 1 = <= 2; 2 = <= 3; 3 = <= 4; 4 = <= 5; 5 = 5 >

Q52. In your opinion what is the optimum size for a collaboration group?

N/A	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Summary:

Q53. What other comments would you like to add to this survey?

8.1.2. Pre-study survey raw results

Question	0	1	2	3	4	5	6	7	8	9	10
01. What is your gender?	0	1	2	3	4	5	6	7	8	9	10
02. What is your age group?	0	1	2	3	4	5	6	7	8	9	10
03. Which of the following statements best describes you?	0	1	2	3	4	5	6	7	8	9	10
04. Which of the following devices do you own? (Check all that apply)	0	1	2	3	4	5	6	7	8	9	10
05. Which operating system do you frequently use? (Check all that apply)	0	1	2	3	4	5	6	7	8	9	10
How many hours a week are you engaged in each of the following activities with an electronic device? 0 = None; 1 = 1 hour; 2 = 1-2 hours; 3 = 3-5 hours; 4 = 6-10 hours; 5 = 11-15 hours	0	1	2	3	4	5	6	7	8	9	10
06. Studying	10	9	8	7	6	5	4	3	2	1	0
07. Playing computer games	10	9	8	7	6	5	4	3	2	1	0
08. Downloading and listening to music and podcasts	10	9	8	7	6	5	4	3	2	1	0
09. Downloading and watching music	10	9	8	7	6	5	4	3	2	1	0
10. Checking via email and instant messaging	10	9	8	7	6	5	4	3	2	1	0
11. Surfing the Internet for pleasure	10	9	8	7	6	5	4	3	2	1	0
What is your skill level using the following computer programs and applications? 0 = None; 1 = Very confident; 2 = Confident; 3 = Quite Satisfied; 4 = Satisfied; 5 = Very satisfied	0	1	2	3	4	5	6	7	8	9	10
12. Email	10	9	8	7	6	5	4	3	2	1	0
13. Instant Messaging	10	9	8	7	6	5	4	3	2	1	0
14. Web Surfing	10	9	8	7	6	5	4	3	2	1	0
15. Word Processing	10	9	8	7	6	5	4	3	2	1	0
16. Spreadsheets	10	9	8	7	6	5	4	3	2	1	0
17. Presentation software	10	9	8	7	6	5	4	3	2	1	0
18. Image and Graphic software	10	9	8	7	6	5	4	3	2	1	0
19. Coding and editing audio	10	9	8	7	6	5	4	3	2	1	0
20. Creating and editing video	10	9	8	7	6	5	4	3	2	1	0
21. Creating and editing web pages	10	9	8	7	6	5	4	3	2	1	0
22. Course management systems (Blackboard, WebCT, Moodle, etc)	10	9	8	7	6	5	4	3	2	1	0

Q21. Online is my favorite.

NA	1	2	3	4	5
Never Not applicable	Completely Dislike	Dislike	Neutral	Like	Very Like

Q24. How do you normally connect to the Internet?

NA	1	2	3	4	5
Never	Completely Dislike	Dislike	Neutral	Like	Very Like

The use of technology in learning (page 2) - 100%

Q25. Which of the following best describes your preference with regard to the use of technology?

1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree
1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree

Q27. The use of technology in my classes meets my expectations.

1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree
1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree

Q28. The instructor's use of technology in my classes can increase my interest in the subject matter.

1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree
1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree

Q29. I find that I get better grades in courses that use IT.

1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree
1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree

Q30. The use of IT in class helps me better understand complex or abstract concepts.

1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree
1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree

Q31. The use of IT in courses helps me better communicate with the instructor.

1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree
1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree

Q32. The use of IT in courses has resulted in positive feedback from my instructors.

1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree
1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree

Q33. The use of IT in courses helps me communicate and collaborate with my classmates.

1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree
1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree

Q34. The use of IT in courses provides more opportunities for practice and team reinforcement.

1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree
1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree

Q35. Classes that use IT allow me to take greater control in my class activities (e.g. managing, analyzing, etc.).

1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree
1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree

The use of technology in learning (page 3) - 100%

Q36. How often do you use a course management system such as Blackboard, WebCT, or Moodle to learn?

1 - Never	2 - Rarely	3 - Sometimes	4 - Often	5 - Very Often
1 - Never	2 - Rarely	3 - Sometimes	4 - Often	5 - Very Often

Q37. I have used a course management system to learn.

1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree
1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree

Q38. Overall, I enjoyed the experience of using a course management system.

1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree
1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree

Q39. Would you be willing to use a learning management system for future courses?

1 - Yes	2 - No
1 - Yes	2 - No

Q40. What are the barriers for you (if any) to using a computer or IT in your class work? Check all that apply.

1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree
1 - Not Applicable	2 - Strongly Disagree	3 - Disagree	4 - Neutral	5 - Agree	6 - Strongly Agree

Q40. Do you have access to the Defence Forces Intranet from your sub-unit HQ?

Yes	No
3	6

Q41. In your opinion what are the obstacles currently affecting the expansion and use of e-learning in the Reserve Defence Forces? Check all that apply.

Lack of hardware	Lack of software	Lack of Intranet connection	Inadequate information about the use of technology	Lack of adequate training for instructors and students	Student and instructor resistance to using IT	Concerns over security	Other (Please Explain)
3		1	2	3			

Q42. How would you most like to receive training material for future courses?

Printed Notes	Online	Initially online but followed with a traditional class to reinforce the material	In a traditional classroom	Other (Please Explain)
1	2	2	4	

Q43. How would you least like to receive training material for future courses?

Printed Notes	Online	Initially online but followed with a traditional class to reinforce the material	In a traditional classroom	Other (Please Explain)
2	3	2	2	

N/A - Not Applicable; 1 - Very Infrequently; 2 - Infrequently; 3 - Rarely; 4 - Frequently; 5 - Very Frequently

Q44. As a student how frequently are you presented with an IT solution for the delivery of learning?

Not Applicable	Very Infrequently	Infrequently	Rarely	Frequently	Very Frequently
	3		4	2	

Q45. As an instructor how frequently are you presented with an IT solution for the delivery of learning?

Not Applicable	Very Infrequently	Infrequently	Rarely	Frequently	Very Frequently
	5	2		2	

Development of higher order thinking skills:

n/a - Not Applicable; 1 - Strongly Disagree; 2 - Disagree; 3 - Neither Agree Nor Disagree; 4 - Agree; 5 - Strongly Agree

Q46. I believe I am capable of conducting effective research on a given topic.

Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
		1	3	4	1

Q47. I believe I am capable of analysing information and identifying its key components.

Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
		2		7	

n/a - Not Applicable; 1 - Strongly Disagree; 2 - Disagree; 3 - Neither Agree Nor Disagree; 4 - Agree; 5 - Strongly Agree

Q48. I believe there is value in developing higher order thinking skills in the military?

Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
		1	1	6	1

Q49. At what level of training should higher order thinking skills be taught to students?

Private	Junior NCO	Senior NCO	Junior Officer	Senior Officer
2	3	3	1	

Q50. If given the option of individual or group study for a project which would you prefer?

Individual	Group
5	4

Q51. Please explain why you selected that option?

N/A - Not Applicable; 1 - <=2; 2 - <=3; 3 - <=4; 4 - <=5; 5 - >

Q52. In your opinion what is the optimum size for a collaboration group?

Not Applicable	Less than or equal to 2	Less than or equal to 3	Less than or equal to 4	Less than or equal to 5	Greater than 5
	1	2	2	3	1

Summary:

Q53. What other comments would you like to add to this survey?

8.2. Appendix B: WebQuest

8.2.1. Introduction

- You are a Platoon Commander in the 1st Battalion, 5th Marines (Reserve). You have been called from your civilian employment and activated in preparation for a tour of duty in Iraq. You set your personal affairs in order and say good bye to your family. For the next three months you and your Battalion will undergo intensive preparation work to develop the necessary skills to accomplish your mission during your tour of duty.
- Prior to training with your Platoon, your Battalion Commander has decided that all Officers will attend a Junior Commanders Command and Staff course. The purpose of this course is to prepare Junior Commanders for their role in Iraq by reviewing historical and current battles and taking the lessons learnt from these battles and applying them to situations which the Battalion will face during their tour of duty.
- How does this type of scenario apply to the Irish Reserve Defence Forces? Senior Officers in the Defence Forces and members of government have openly stated that in the not too distant future members of the RDF will be eligible to serve on overseas deployments.
- You have been requested to participate on a working board tasked with developing a report investigating the potential issues for the RDF serving overseas. Using the problems encountered by Allied reserve forces serving in the Iraq conflict as a guide, you will investigate how these reserve units are struggling to accomplish the tasks assigned to them and how these issues might affect the RDF when it deploys overseas.

8.2.2. *Task*

- Your task will be to conduct a detailed review the battle for Fallujah and the suspected war crimes during this operation in order to highlight valuable lessons from this conflict which can be used to highlight to your Platoon the difficulties of operating in Iraq.
- Summarise the problems faced by reserve members serving in Iraq and formulate preventative measures to ensure this problems do not arise when the RDF serve overseas.

8.2.3. *Process*

- In order to accomplish this task you should prepare a 45 minute presentation on the battle for Fallujah:
 - Develop a timeline of events and a detailed review for the battle of Fallujah in both Operation “Vigilant Resolve” and Operation “Phantom Fury” including maps, causality reports and any other items of interest.
 - A number of high profile suspected war crimes have been uncovered during this and similar battles in Iraq. Discuss some of the steps which you as a Platoon Commander can take to ensure that the men under your command do not make these same mistakes.
- Discuss the role of Reserves in the Iraq war.
 - In particular, discuss the level of preparation training for such missions and the effect of prolonged overseas deployment on families, employment and general recruiting.
 - Based on the current training in the reserve, what lessons can be applied to the RDF before any future overseas postings are made available to the RDF.
 - What suggested improvements and additional training will be required for a Company of reservists to be made available for an overseas peacekeeping operation such as KFOR.
 - Aim to develop a 3000-5000 word report as a guide.

8.2.4. Resources

The resources listed here are suggested areas for reference material; you are NOT restricted to these areas. If you wish you may reference other sites or book, journals etc., additional marks will be awarded for extra reference sites.

- Iraq War
 - http://en.wikipedia.org/wiki/Iraq_war
 - http://en.wikipedia.org/wiki/2003_invasion_of_iraq
 - <http://icasualties.org/oif/>
 - http://aljazeera.com/me.asp?service_ID=9964
 - <http://thinkprogress.org/iraq-timeline>
 - http://news.bbc.co.uk/2/hi/in_depth/middle_east/2002/conflict_with_iraq/default.stm
 - <http://www.alternet.org/story/16274>
 - http://www.gulfwarrior.org/iraq/iraq_wall_full_2003.jpeg
 - <http://www.usiraqprocon.org/>

- Fallujah
 - http://en.wikipedia.org/wiki/Operation_Vigilant_Resolve
 - http://en.wikipedia.org/wiki/Second_Battle_of_Fallujah
 - http://en.wikipedia.org/wiki/US_occupation_of_Fallujah
 - <http://en.wikipedia.org/wiki/Fallujah>
 - <http://www.guardian.co.uk/flash/0,5860,1193510,00.html>
 - http://www.military.com/NewContent/0,13190,GH_Fallujah_112004-P1,00.html
 - http://www.channel4.com/news/2005/01/week_2/11_iraq.html
 - <http://www.globalsecurity.org/military/ops/oif-lessons-learned.htm>
 - http://www.dahrjmailiraq.com/covering_iraq/archives//000197.php
 - http://news.bbc.co.uk/1/hi/world/middle_east/3235213.stm

- http://seattletimes.nwsourc.com/html/nationworld/2002097538_realb_oss22.html
- http://www.kevinsites.net/2004_11_21_archive.html#110107420331292115
- <http://council.smallwarsjournal.com/index.php>
- <http://www.fallujah.us/USACasualites.xls>
- <http://www.fallujah.us/>
- <http://video.google.com/videoplay?docid=-1134673789364675735&q=fallujah+hidden&pl=true>
- War Crimes in Iraq
 - http://en.wikipedia.org/wiki/Ilario_Pantano
 - <http://spj.org/gc-text1.asp?#3>
 - <http://www.wsws.org/articles/2004/sep2004/medi-s15.shtml>
 - http://en.wikipedia.org/wiki/Abu_Ghraib_prisoner_abuse
 - <http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2006/05/27/wus27.xml>
 - <http://hrw.org/english/docs/2005/10/03/iraq11804.htm>
 - <http://www.informationclearinghouse.info/article9829.htm>
 - http://en.wikipedia.org/wiki/Hamdania_incident
 - http://en.wikipedia.org/wiki/Abeer_Qassim_Hamza
 - <http://www.alternet.org/waroniraq/28833/>
 - http://www.washingtonpost.com/wp-dyn/content/article/2006/08/27/AR2006082700770_pf.html
 - http://www.opendemocracy.net/democracy-americanpower/iraq_warcrimes_3627.jsp
 - <http://www.ivaw.org/>
 - <http://www.crimesofwar.org/>

- <http://www.crimesofwar.org/onnews/news-commissions4.html>
- <http://www.crimesofwar.org/onnews/news-miscon.html>
- Use of Reserves in Iraq
 - http://www.spacewar.com/reports/US_Army_Wants_To_Send_Reserve_Forces_Back_To_Iraq_999.html
 - <http://www.americanprogress.org/issues/2004/09/b190445.html>
 - http://www.washingtonpost.com/wp-dyn/content/article/2006/11/04/AR2006110401160_pf.html
 - <http://www.heritage.org/Research/NationalSecurity/wml293.cfm>
 - <http://www.latimes.com/news/nationworld/nation/la-na-military12jan12.0,7198945.story?coll=la-home-headlines>
 - http://findarticles.com/p/articles/mi_m0KNN/is_36/ai_n13807585/pg_1
 - <http://www.commondreams.org/headlines05/0820-01.htm>
 - <http://www.armedforcesjournal.com/2006/06/1813594>
 - <http://www.slate.com/id/2108357/>
 - <http://www.chron.com/disp/story.mpl/special/iraq/3307908.html>
 - <http://www.nytimes.com/2005/10/26/international/middleeast/26deaths.html?ex=1287979200&en=779f850c4d5db040&ei=5088&partner=rss-nyt&emc=rss>
 - <http://news.bbc.co.uk/2/hi/americas/4150749.stm>
 - http://www.truthout.org/docs_2006/010907C.shtml
 - http://www.usatoday.com/news/nation/2003-09-29-reserves_x.htm
 - http://www.military.com/NewsContent/0,13319,FL_goal_071205.00.html
 - <http://www.latimes.com/news/nationworld/nation/la-na-soldiers12jan12.0,6215899.story?coll=la-home-headlines>
 - <http://www.alternet.org/waroniraq/20083/>

- <http://www.washingtonpost.com/wp-dyn/articles/A18980-2004Jun5.html>
- <http://www.antiwar.com/lind/?articleid=3651>
- http://www.boston.com/news/local/articles/2006/08/30/guard_families_cope_in_two_dimensions/
- <http://www.npr.org/templates/story/story.php?storyId=4531883>
- <http://www.ips-dc.org/iraq/quagmire/>

8.2.5. Evaluation

		Criteria	0	0.5	1	1.5	2	2.5	3	3.5	4	Scores		
												Raw	Weight	Total
Mechanica	1	Technical	Project does not run satisfactorily. There are too many technical problems to view the project.		Project runs minimally. There are many technical problems when viewing the project.		Project runs adequately with minor technical problems.		Project runs perfectly with no technical problems. For example, there are no error messages, all links are found.				x1	
	2	Organisation	The sequence of information is not logical. Menus and paths to information are not evident.		The sequence of information is somewhat logical. Menus and paths are confusing and flawed.		The sequence of information is logical. Menus and paths to most information are clear and direct.		The sequence of information is logical and intuitive. Menus and paths to all information are clear and direct.				x2	
	3	Navigation	Buttons or navigational tools are absent or confusing. No buttons and navigational tools work.		Minimal difficulty experienced while navigating through the project.		Few difficulties experienced while navigating through the project.		Users can progress intuitively throughout the entire project in a logical path to find information. All buttons and navigational tools work.				x1	
	4	Spelling and Grammar	Project has multiple errors in spelling and grammar. (Ten or more errors).		Project minimally honours rules of spelling and grammar. (Seven or less errors).		Project adequately honours most rules of spelling and grammar. (Five or less errors).		Project honours all rules of spelling and grammar.				x1	
	5	Completion	Project is incomplete and contains many unfinished elements.		Project is incomplete and contains several unfinished elements.		Project is incomplete and contains some unfinished elements.		Project is completely finished.				x1	
Multimedia Elements	6	Screen Design	Screens are either barren and stark or confusing and cluttered. Exaggerated emphasis on graphics and special effects weakens the message and interferes with the communication of content and ideas.		Multimedia elements accompany content but there is little sign of mutual reinforcement. There is no attention to visual design criteria such as balance, proportion, harmony and restraint. There is some tendency toward random use of graphical elements that do no reinforce the message.		Multimedia elements and content combine to adequately deliver a high impact message with the elements and words reinforcing each other.		The combination of multimedia elements and content takes communication to a superior level. There is clear attention given to balance, proportion, harmony, and restraint. The synergy reaches the intended audience with style and pizzazz.				x1	
	7	Use of Enhancements	No graphics, video, audio, 3-D, or other enhancements are present or use of these tools is inappropriate.		Limited graphics, video, audio, 3-D, or others enhancements are present but do not always enrich the learning experience. In some instances, use of these enhancements is inappropriate.		Most graphics, video, audio, 3-D, or other enhancements are used appropriately to enrich the experience. For example, clips are either too long or too short to be meaningful.		All graphics, video, audio, 3-D, or other enhancements are used effectively to enrich the learning experience. Enhancements contribute significantly to convey the intended meaning.				x1	

Quality of Content	8	Originality	The work is a minimal collection or rehash of other people's ideas, products, images and inventions. There is no evidence of new thought.	The work is an extensive collection and rehash of other people's ideas, products, images and inventions. There is little evidence of new thought or inventiveness.	The project shows some evidence of originality and inventiveness. While based on an extensive collection of other people's ideas, products, images and inventions, the work extends beyond that collection to offer new insights.	The project shows significant evidence of originality and inventiveness. The majority of the content and many of the ideas are fresh, original, and inventive.	x3
	9	Sources	Very little or no source information was collected.	Source information collected for all graphics, facts and quotes, but not documented in an acceptable format.	Source information collected for all graphics, facts and quotes. Most of which are documented in an acceptable format.	Source information collected for all graphics, facts and quotes. All documented in an acceptable format.	x1
	10	Evidence that objectives were met	No evidence that project content supports stated objectives.	Little evidence that project content supports stated objectives.	Some evidence that project content supports stated objectives.	Clear evidence that project content supports stated objectives.	x3
	11	Depth and Breadth of Project Content	No evidence that higher level thinking skills were used in the creation of this project.	Little evidence that higher level thinking skills were used in the creation of this project.	Some evidence that higher level thinking skills were used in the creation of this project.	Clear evidence that higher level thinking skills were used in the creation of this project.	x2
	12	Subject Knowledge	Subject knowledge is not evident. Information is confusing, incorrect, or flawed.	Some subject knowledge is evident. Some information is confusing, incorrect, or flawed.	Subject knowledge is evident in much of the project. Most information is clear, appropriate, and correct.	Subject knowledge is evident throughout the project. All information is clear, appropriate, and correct.	x2
Group Collaboration	13	Capturing Information	Group does not collect any information that relates to the topic.	The group collects very little information - some relates to the topic.	The group collects some basic information - most relates to the topic.	The group collects a great deal of information - all of which relates to the topic.	x1
	14	Discussions	Group does not relay or discuss and information.	Group relays and discusses very little information.	Group relays and discusses some information.	Group relays and discusses a great deal of information.	x2
	15	Teamwork	Group does not show any teamwork.	Group does not show much teamwork.	Group works well together as a team.	Group works very well together as a team.	x1
	16	Assignment Completion	Team members rely on others to complete the assigned work.	Team members rarely complete the assigned work often needing reminders.	Team members normally complete the assigned work without reminder.	Team members always complete the assigned work with have to be reminded.	x1
	17	Cooperation within the team	No team members listen to each other and never reach a compromise.	Most team members do not listen to each other and normally do not compromise.	Most team members listens to each other and normally reach a fair compromise.	Each team member listens to each other in order to reach a fair compromise.	x1

PowerPoint Submission	18	Introduction	The introduction does not orient the audience to what will follow. The sequencing is unclear and does not appear interesting or relevant to the audience.	The introduction shows some structure but does not create a strong sense of what is to follow. May be overly detailed or incomplete and is somewhat appealing to the audience.	The introduction is clear and coherent and relates to the topic.	The introduction presents the overall topic and draws the audience into the presentation with compelling questions or by relating to the audience's interests or goals.	x1
	19	Content	The content lacks a clear point of view and logical sequence of information. Includes little persuasive information and only one or two facts about the topic. Information is incomplete, out of date and/or incorrect. Sequencing of ideas is unclear.	The content is vague in conveying a point of view and does not create a strong sense of purpose. Includes some persuasive information with few facts. Some of the information may not seem to fit. Sources used appear unreliable.	The content is written with a logical progression of ideas and supporting information. Includes persuasive information from reliable sources.	The content is written clearly and concisely with a logical progression of ideas and supporting information. The project includes motivating questions and advanced organizers. The project gives the audience a clear sense of the project's main idea. Information is accurate, current and comes mainly from 'primary sources.	x2
	20	Text Elements	The text is extremely difficult to read with long blocks of text and small point size of fonts, inappropriate contrasting colours, poor use of headings, subheadings, indentations, or bold formatting.	Overall readability is difficult with lengthy paragraphs, too many different fonts, dark or busy background, overuse of bold or lack of appropriate indentations of text.	Sometimes the fonts are easy-to-read, but in a few places the use of fonts, italics, bold, long paragraphs, colour or busy background detracts and does not enhance readability.	The fonts are easy-to-read and point size varies appropriately for headings and text. Use of italics, bold, and indentations enhances readability. Text is appropriate in length for the target audience and to the point. The background and colours enhance the readability of text.	x1
	21	Layout	The layout is cluttered, confusing, and does not use spacing, headings and subheadings to enhance the readability.	The layout shows some structure, but appears cluttered and busy or distracting with large gaps of white space or uses a distracting background.	The layout uses horizontal and vertical white space appropriately.	The layout is visually pleasing and contributes to the overall message with appropriate use of headings, subheadings and white space.	x1
	22	Graphics, Sound and Animation	The graphics, sounds, and/or animations are unrelated to the content. Graphics do not enhance understanding of the content, or are distracting decorations that create a busy feeling and detract from the content.	Some of the graphics, sounds, and/or animations seem unrelated to the topic/theme and do not enhance the overall concepts. Most images are clipart or recycled from the WWW. Images are too large/small in size. Images are poorly cropped or the colour/resolution is fuzzy.	The graphics, sound and/or animation visually depict material and assist the audience in understanding the flow of information or content. Original images are used. Images are proper size, resolution.	The graphics, sound and/or animation assist in presenting an overall theme and enhance understanding of concept, ideas and relationships. Original images are created using proper size and resolution, and all images enhance the content. There is a consistent visual theme.	x1
	<p>Rubric based on the following websites http://www.ncsu.edu/midlink/mm2002.rubric.htm http://projects.edtech.sandi.net/morse/oceanhealth/rubrics/collrubric.html http://www.uwstout.edu/soe/profdev/pptrubric.html</p>						

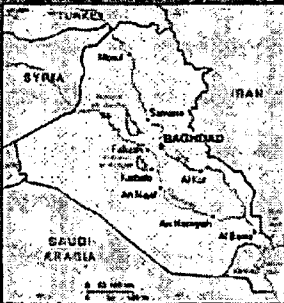

8.2.6. Conclusion

Having completed this review of the battle for Fallujah and the issues concerning the use of Reservists in Iraq you should now:

- Have increased your ability to perform Internet searches.
- Work as a team.
- Plan and project manage group tasks.
- Have developed a better appreciation of current Iraq war.
- Have a detailed knowledge of the battle for Fallujah and be able to discuss its mistakes.
- Be aware of war crimes conducted in Iraq.
- Have an appreciation of the implications of Reserves serving overseas and how the Irish RDF may need to change in order to succeed in preparing for future operations.
- NOTE: Using material gathered I hope to include two articles in An Cosantóir: (1) The Battle of Fallujah and (2) an article discussing possible RDF deployment overseas. Each article will be a combination of the submitted material and accredited to all of the students on the course.

8.3. Appendix C: Assignment Samples

8.3.1. Individual WebQuest

<h2>Battle of Fallujah 2004</h2>	<h2>Contents</h2> <ul style="list-style-type: none">• Background to the Battles• Operation Vigilant Resolve• Operation Phantom Fury• Overall Results of the Battle• Alleged War Crimes• Prevention of war crimes in the future• References
<h2>Timeline 2003 - Iraq War</h2> <ul style="list-style-type: none">• 19 Mar - War on Iraq begins• 4 to 9 Apr - Battle for Baghdad• 1 May - End of "major combat operations"• 13 Dec - Saddam Hussein captured	<h2>Timeline 2004 - Fallujah</h2> <ul style="list-style-type: none">• 28 Apr - 17 protesting civilians killed by US troops in Fallujah• 31 Mar - 4 US contractors killed in Fallujah• 4 Apr to 1 May - 1st Battle of Fallujah• 30 Apr - Fallujah handed over to Iraqi rebels• 7 Nov to 23 Dec - 2nd Battle of Fallujah
<h2>Fallujah</h2>  <ul style="list-style-type: none">• Population<ul style="list-style-type: none">• c.50,000 (pre-war)• Religion<ul style="list-style-type: none">• Sunni Muslim majority• Allegiance<ul style="list-style-type: none">• Tolered Saddam (wealth & influence)	 <p>Global Security.org Public Eye DIGITALGLOBE</p>

Fallujah following the Invasion

- Saddam released all the inmates of the large nearby Abu Gh'rab prison. Criminals started looting
- Due to a large Ba'ath Party compound & many nearby military / paramilitary units there are large numbers of trained personnel and weapons in city
- Little fighting when US forces reached Fallujah (1 month after invasion), as Iraqi Army dropped arms & blended into civilian population

Fallujah following the Invasion

- Local tribal leaders selected a pro-US mayor following fall of Saddam
- All-in-all Fallujah was one of the most peaceful parts of Iraq

23 April 2003

- Allied forces reach & occupy Fallujah
 - 1st Bn, 2nd Bde, 82nd Airborne Div, US Army (c.700 troops)
- Occupied following positions:
 - Local Ba'ath Party HQ
 - Local al-Qa'id school (Charlie Coy - c.150 troops)
 - Ba'ath Party holiday resort just outside city (Dreamland)
- Iraqis had hoped US troops would stay outside city

28 April 2003

- 200 civilians broke the US curfew to protest at the closing of a school so it could be used to house US troops. Both negotiations and smoke grenades failed to disperse crowd.
- US personnel (82nd Abn) on the roof of the school fired into the crowd killing 17 and injuring over 70. While US forces claim that they were merely returning fire, Iraqis claim that there was only stone throwing. No US casualties. Shootings occurred over a period of 1 to 10 minutes.

30 April 2003

- 82nd Airborne replaced in Fallujah
 - 2nd Troop (Fox), 3rd Armd Cav Regt, US Army
 - Significantly less personnel
 - Over stretched
 - Withdrew from secondary school
- Further civilian protest in front of Ba'ath Party HQ. 3 further civilian deaths

4 June 2004

- 3rd Armd Cav Regt was responsible for whole of Al-Anbar region at first, with only a troop (coy sized) in Fallujah
- Fallujah reinforced
 - 2nd Sqn, 1 Armd Cav Regt (Bn sized unit)
 - 3rd Armd Cav Regt subsequently replaced by 2nd Bde, 3rd Inf Div

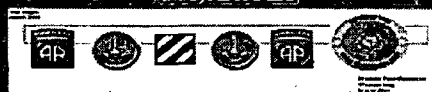
June 2004

- Iraqi officials start to lodge complaints with US forces:
 - Population growing agitated
 - US soldiers ogling Iraqi women
 - Handing out sweets with pictures of women on them
- US forces confiscating motorcycles to prevent their use by suicide bombers

30 June 2003

- Massive explosion in Fallujah mosque
 - 9 people killed
 - Iraqis claim it was caused by US missile
 - US claim accident in terrorist training camp
- Previous number of days had been extremely quiet

Rotations



- After only 2 months in Fallujah, 3rd Infantry Div was rotated home.
- 3rd Armored Cav Regt returned to the city, again with only 1 squadron, again responsible for all of Al Anbar.
- Sept 2003 – Cavalry reinforced by 3rd Bde, 82nd Abn. This Bde was only responsible for 2 cities of An Anbar (Ramadi & Fallujah).
- March 2004 – Cavalry & Airborne rotated home and replaced by I Marine Expeditionary Force

Policy of US units in Fallujah

- 82nd Airborne Div
- 3rd Infantry Div
- 3rd Armored Cav Regt
- Leave Fallujah alone as much as possible, little likely insurgent activity (leaders were pro-US).
- Allow Iraqi Police & Iraqi Civil Defence Corps to police area (with little success). Insurgent attacks on police stations Kill 20.

Policy of US units in Fallujah

- I Marine Expeditionary Force
 - Complete withdrawal of US forces from Fallujah due to increasing violence led by former Iraqi army personnel
 - Commanders Intent
 - Foot patrols
 - Less aggressive raids
 - CDMC Ops
 - Humanitarian aid
 - Co-operation with local leaders

31 March 2004

- Iraqi insurgents attack a US Army food convoy escorted by private contractors (Blackwater USA)
- The 4 US contractors escorting the convoy, were taken from their vehicles, beaten and set alight.

31 March 2004



- After being dragged through the streets their bodies are hung from a bridge over the Euphrates River.
- These pictures are broadcast around the world

Operation Vigilant Resolve

4 April – 1 May 2004

Operation Vigilant Resolve

- Launches a direct result of killing of contractors and killing of 5 US soldiers in Habbaniya
- Commanders Intent
 - Major assault to occupy city
- US strength – approx 1,900 (mainly from 1 Marine Div)
- Insurgent strength – approx 12,000

4 April 2004

- Some civilian homes hit by aerial bombardment
- Sporadic gunfire during night

5 April 2004

- US seal off city to prevent Iraqi escape/reinforcement
- US troops call for civilians to remain in their homes & help identify those involved in 31 March killings.
- Local radio station occupied by Marines.

The battle up to 8 April 2004

- US announced it may not be able to successfully occupy and hold Fallujah; US only held 25% of city.
- Only 1/3 of civilians had fled city. US forces closed the city's 1 main hospital.
- Operation Vigilant Resolve caused major escalation of fighting across Iraq: rise of Mahdi Army, desertions from Iraqi Police & Civil Defence Corps and Sunni rebellion in Ramadi.
- US deployed AC-130 gunships and snipers.

9 April 2004

- US comes under pressure from Iraqis (and media) to halt assault.
- US Administrator of Iraq declares cease-fire and offers negotiations, on condition that the only reporter (from Al-Jazeera) in Fallujah withdraw from the city.
- Humanitarian aid enters city. Insurgents remain in control. Over 70,000 civilians allowed to leave city.

13-30 April 2004

- Sporadic fighting in Fallujah
- Occasional bombing by US aircraft
- Plan for joint US/Iraqi patrols developed
- Armed elements in Fallujah move from being secular nationalists to groups led by warlords and criminals.

Withdrawal

- US forces withdraw from Fallujah for second time on 1 May 2004 (having gained control of half of city (the less populated areas))
- Security turned over to Fallujah Bde – force of 1,000 former Iraqi soldiers of questionable loyalty, told to prevent attacks on US forces based around Fallujah

Results

- Main enemy no longer supporters of Saddam
- Use of regional militias (eg Fallujah Bde) is disastrous
- Development of "Sunni Triangle" of insurgent controlled territory. Almost daily firefights.



Results

- Extremely poor media reaction.
- At least 50 kidnappings of Iraqi and foreign workers.
- Casualties
 - US: 27 killed, 90+ wounded
 - Iraqi (Insurgents & civilians): 271 to 731 killed

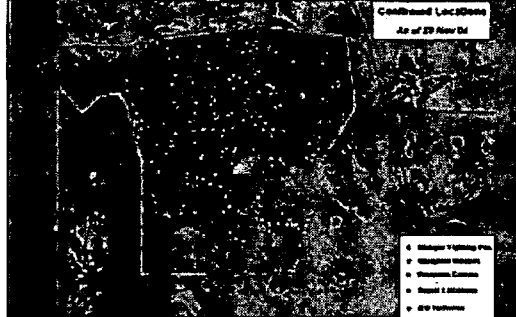
Operation Phantom Fury

7 November – 23 December 2004

6 November 2004

- Allied forces mass north of Fallujah, mainly US Marines with some Iraqi units, two days after GW Bush is reelected.
- Cordon of checkpoints established around city.
- Insurgents have created well fortified positions by this stage.

Insurgent Positions



7 November 2004

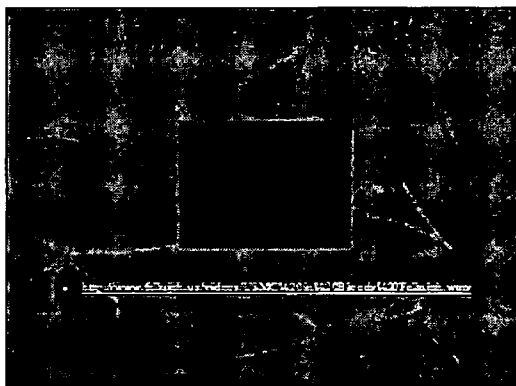
- 2,000 US & 600 Iraqi troops cross start lines north and west of Fallujah.
 - Northern rail yards.
 - Dangerous Jolan & Askari districts.
- 1,000 to 6,000 insurgents fight in small units as part of organized withdrawal. Many insurgents avoid US forces and melt into population. Fighting heavier than expected.

7 November 2004

- Iraqi Commando Bn & US Marine Light Armad Recce Bn attack from west and south. Fallujah General Hospital & villages on opposite river banks secured.
- Jurf Kas Suskr bridge over Euphrates secured.
- This is mainly a diversion.

8 November 2004

- Morning - Main train station in US hands.
- Afternoon - Hay Naib al-Dubat & al-Naziza areas in US hands.
- US forces require extensive air cover.



9 November 2004

- US forces almost reach centre of Fallujah.
- Guerrilla tactics – IEDs & sniper attacks.
- US conducting house-to-house searches.
- Use of cluster bombs & White Phosphorous in civilian areas.
- Nightfall – Marines in centre of city.

15 November 2004

- US & Iraqi forces have moved through most of the city. However, numerous pockets of insurgents remain throughout the city.
- Fierce fighting in the south east (Shuhada area)



16 November 2004

- Operation now described as mopping up operation.
- Fallujah sees sporadic fighting.

Casualties

- US
 - 95 killed
 - 736 injured
- Insurgents (estimated)
 - 1,200 killed
 - 1,500+ injured
- Friendly Iraqis
 - 8 killed
 - 43 injured

Overall Results of the Battle

- Bloodiest battle in Iraq War up to that time.
- Known as city of the mosques. City housed 100 mosques. Around 60 used as insurgent positions. US forces cleared all of these and destroyed them.
- All civilians required to carry ID cards at all times. Over 50% of houses and 60 schools suffered some damage.

Overall Results of the Battle

- Only 30% of population returned by March 2005
- Estimated 50% of homes damaged in fighting. Compensation scheme very time consuming and offered low rates. Is this battle to help to help the population or against it?

Overall Result of the Battle

- Largely successful
 - Significant numbers of insurgents killed/captured
 - Sunni rebellion put down
 - Al Qaeda foothold in Iraq devastated
- City still has insurgent elements (or be them in smaller numbers) and still sees fighting



Alleged War Crimes

Alleged War Crimes

- Use of chemical weapons – White Phosphorus. An incendiary chemical used for screening and also as a weapon, inflicting horrific injuries. A terror weapon!
- Use of unguided munitions on buildings occupied by civilians – A C-130 with mini guns and 105mm howitzer.
- Use of cluster bombs in civilian areas.

Alleged War Crimes

- One US unit had orders to shoot any male of military age on the streets after dark.
- Numerous reports of US troops killing unarmed civilians and firing on ambulances. Representations made by Iraqi government to US Administrator.
- Closure of hospitals and placing of sniper in hospital

Alleged War Crimes

- Daily aerial attacks on residential areas in Fallujah. Intelligence alleged indicated areas were used as "safe houses"
- Refugees prevented from leaving city.
- Shootings of unarmed prisoners. Eg famous incident of injured prisoner in mosque

Alleged War Crimes

- Use of places of worship & hospitals as fighting positions by insurgents
- GW Bush only ordered US forces to comply with Geneva Convention on 7 July 2006.
- Verbal & physical abuse of population

A strategy for the future US platoon commander to prevent war crimes

Preparation – know what to expect!

- The Plt Comdr
 - Study all available after action reviews from returning units
 - Comms personnel with experience of specific AO and FSOs elsewhere
- The platoon
 - Prepare them mentally & physically for the type of ops they can expect
- SOPs & drills
 - Use other units experience to adapt SOPs & drills
 - Mic aware necessary
 - Hearns & Meads
- Conduct map & photo appreciation of AO

Apply principles of OOTW

- Objectives – clear & specific
- Economy of force – employ all resources in most effective ops
- Unity of comd/effort – All personnel have a common aim
- Security – Force protection – Body armour & AFVs – Low profile if possible

Apply principles of OOTW

- Simplicity – Keep orders & drills clear and concise
- Legitimacy – Proactive approach, win the hearts & minds of the population, CIMIC ops
- Adaptability – Ensure drills & personnel are versatile

Apply principles of OOTW

- Perseverance - Keep personnel patient. Avoid hitting up troops but keep them mentally on their toes.
- Restraint - Avoid use of force if at all possible. Ensure troops always use min amount of force & rounds as possible

Strategy

- Prepare for COIN ops supporting the following objectives
 - Political - allow elected government to establish control
 - Economic - allow normal business to restart
 - Psychological - support the civilians
 - Military - defeat the insurgents

Realistic Training

- Get troops as familiar with terrain as possible - maps, models, photos
- TEWTs for NCOs & officers
- Intensive exercises with all types of scenarios using real life enemy (war games)

Prepare the troops

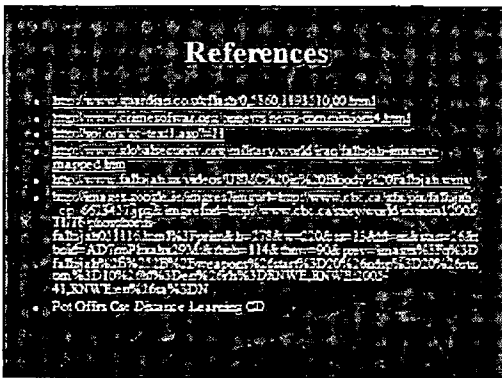
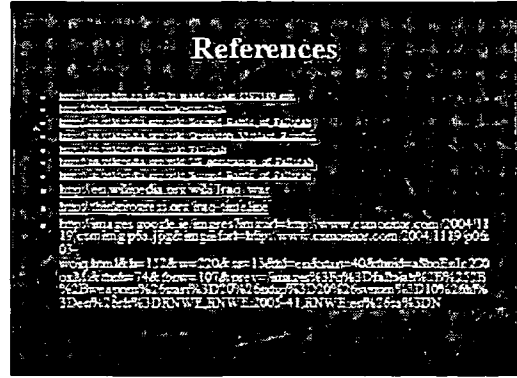
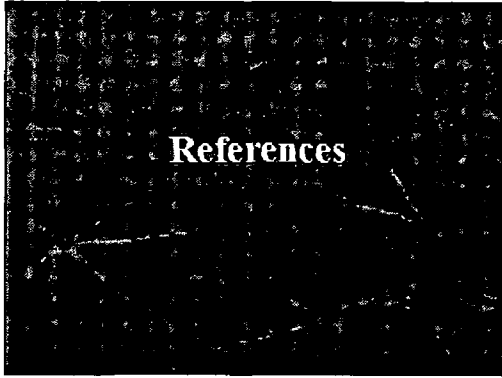
- Mission Readiness Exercise in similar area
- IED awareness training (SSTs)
- Basic & advanced language training for all ranks
- Training on Iraqi culture & history
- PTSD & CISM training
- Human rights & Geneva Convention awareness

Prepare the troops

- Mentally prepare the troop to suffer casualties. Frequently rehearse CASEVAC procedures
- Ensure troops know & talk honestly with each other
- Be there for the troops and maintain morale
- Lead from the front!

Develop Mission Statement

- Example
 - To return to the US having supported Iraqi Government forces in encouraging a safe & secure environment for the civil population. Achieving this with as few casualties (on ALL sides) as possible using the minimum available force (as necessary).



8.3.2. Group WebQuest

Level of Preparation and Impact of over seas missions on Reservists

The role of the reserves in Iraq

As the Iraq War now enters its fourth year the role of the Reserve soldiers fighting in the front line alongside their full time counterparts has started to come under the spot light once again. With the US defence forces being stretched to their limits and many full time soldiers doing multiple tours of duty, the demands on the reserve soldier have now been greater than ever. Recent figures have shown that up to 40% of the 140,000 U.S troops currently serving in Iraq are members of the National Guard or the Reserve component. Other figures taken from the start of the conflict have shown that the statistics are even more staggering; more than 650,000 soldiers have served in the Iraq war since it began, with 185,000 of them from the National Guard. At one point in 2004, more than 60% of the soldiers in Iraq were Guard soldiers or reserves.

Confronted with these increasing demands of the Iraq war, the Pentagon recently announced in January 2007 plans to recall Army National Guard units that have already fought in Iraq to serve second tours, reversing a long-standing policy that allowed National Guard members to return home for five years before being redeployed. The policy change is supported by the U.S. military, in particular by Army Chief of Staff Gen. Peter Schoomaker who told the commission recently that if the policy was not changed the U.S. Army will break under the strain of the Iraq war.



But in the race to get these units ready to go is also giving rise to a multitude of problems also. The US army has reduced in size by about 50% since the 1991 Gulf war, and a large portion of those reductions were made in the reserve and National Guard component. But instead of closing down whole units the government at the time went about it by reducing the numbers of personnel in units but maintain the structures already in place. This meant that all the individual states still had their own units for their home state responsibilities but at reduced numbers. Then, when the call for volunteers came after Sept. 11 in 2001, "the best and the brightest" reserve soldiers stepped forward, further depleting already hollow units. With the start of the Iraq war in 2003 it became obvious that it would be necessary to deploy the reserve component to make up the numbers required. This resulted in the already depleted Reserve units being involuntarily mobilised and it was then that the problem created by the volunteer call-up became apparent. They simply just didn't have the numbers of people required.

This then kicked off a practice known in the military as "cross-leveling", a practice whereby individual soldiers are taken from non-mobilised units to fill out the units being deployed and make up the numbers required. While the idea sounds good on paper it soon started giving rise to problems of its own. As Maj. Gen. Arnold Punaro, the chairman of the Commission on National Guard and Reserves said on the cross levelling practice "the units that are deployed

are less cohesive and have not trained together long enough to be ready, and safe, in a demanding combat environment". Some commanders have also been quoted as calling the practice "evil" and saying that there was a direct relationship between combat casualties and cross levelling because of a breakdown in unit cohesion. In 2002, just 2 percent of soldiers in deployed Army Reserve units were cross-levelled into the formation. In 2003, that number jumped to 39 percent and in recent years more than 62 percent of reserve soldiers in deployed Army units were plucked from their home units to serve in another. In some units the cross levelling is almost total.

The demands being placed on the reserve and the National Guard are also being felt by the family and friends of the members serving overseas. The families who would normally be used to having their loved ones about suddenly find themselves having to adjust to live with their brother, sister or mother, father being away for up to a year. Also in a lot of cases it was the main earner of the household that was deployed.



In November 2003, the Marine Corp put together a team to survey the view and opinions of reserve troops returning from their first tour of duty in Iraq, known as the Reserve Combat Assessment team. In their report they list family support as the major area of concern of personnel serving abroad.

The main point brought about in the study found that up to 40% of those surveyed found that the support provided by the Army was poor or unsatisfactory. The main problem seemed to be lack of information from reliable sources or the frustration at the speed whereby information was relayed back to family members. Again this was another problem which stemmed from the cross levelling process, whereby a soldier found himself posted in another unit different from his own in this created yet another barrier to the free flowing of information back to family members. Another interesting fact that appeared was that soldiers who were not married but still had children and/or long term boyfriends/girlfriends felt that their loved ones got an inferior level of support as opposed to those who more traditional "spouses". But in general it was found to be that the families were very supportive of their family member's deployment.

A Pentagon survey in 2000 found that 40% of reservists experience a pay cut when they are deployed and take time out from their civilian employment. They then find that it is not Saddam or Osama Bin Laden who they have to worry about while they are fighting but the debt collector. Again the survey carried out by Reserve Combat Assessment team pretty much found this to be the case also. Out of the 5000 troops surveyed approx one third experienced a financial loss of 10% or more as regards their income while another third actually found an increase, but even more worrying is that 8% experienced a pay cut of over 50% when they were mobilised, these were found to be people how were self employed. Indeed some 30% of those surveyed said that their civilian employer still contributed some partial pay while they were serving abroad which offset the financial loss they would have

otherwise experienced. If this was taken out of the equation that percentage of Mannes who would have experienced a loss of 10% in their income or more would have been 67%.

Again the majority of troops said that their employers supported them while they were deployed with 21% of those said that they did expect to experience problems when returning to the civilian employment. But by far the group who have been hit the worst are the self-employed reservists. When these were questioned a staggering 27% said that their businesses had been irreparably damaged as a result of their deployment overseas and 56% saying that they had been somewhat affected.

Current Training

Inherent skills of Reservists

In a not too distant future we may be looking at members of the Reserve serving abroad in the course of their duties. One of the most strategic questions that must be addressed in planning such duties is the adequacy of current training within the Reserve, and whether such training as it currently stands would allow the discharge of such duties to be carried out on foreign missions. The experience of the Reserves at this point in time is one evening a week in training followed by some weekends per month. This is then supplemented by one or two weeks full time training during the summer. The question that must be addressed is whether this current level of training is adequate or not?

Evening training is for a period of two hours but will in fact typically consist of two 45 minute sessions of training. On a simple statistical comparison with times allocated to members of the PDF, the hours available to the Reserve are miniscule in comparison. Fair-weather soldiering may be levelled at summer training, though in the current political climates, a tropical climate is perhaps more probable than an Irish winter in any future deployment. An analysis of the attendance rates of Reserve as compared to Permanent, also highlights the difficulties that any voluntary army encounters when attendance is not mandatory subject to effective sanctions.

Just as John Donne outlined that "no man is an island, entire of itself" it is not true to say that the skills available to the Reserves are merely those instructed on or currently examined by the Defence Forces. Members of the Reserve bring to the Defence Forces skills that they carry out in civil employment and indeed bring skills and



expertise that the Defence Forces whilst requiring may have difficulty in either obtaining or retaining. Education within Ireland and the strive for a better economy have propelled this country into new and exciting fields of business and industry providing a greater pool of skills from which the Reserve were previously able to draw. Information technology, business management, languages, and near full employment coupled with increased labour mobility within the country and within work spheres ensures that members of the Reserve bring with them dynamic and varied skills that are tested on a day to day basis within an aggressive economic climate in carrying out their daily jobs.

Education received members over the years has ensured that many members of the Reserve not only leave school having received training in such practical area such as languages, but many go on to study areas that are of immediate application to the Defence Forces such as engineering, business management, languages, medicine, law, and information technology. The role of all armies across the world has demanded a more professional army, which in turn has required the up-skilling of existing members in different professional areas. The Reserves on the other hand has with time become more a professional drawn army who require up-skilling in military application of such skills. Increased work pressures, recreational activities, and further education whilst placing pressures on the Reserves for the availability of members for recruiting has ensured however that those recruited are more likely of late to come to the Defence Forces with pre-existing qualifications. In an ever developing army relying on increased levels of technology (to name but one area) one cannot ignore even basic IT skills required for most jobs these days. Even jobs that may not be of immediate application to the Defence Forces do however ensure that members come to the Defence Forces with work ethics and an understanding of goal driven performance.

In the spheres of international missions, Reservists can bring to Defence Forces third level qualifications in languages, the study of international relations, politics, business and sociology, all of which will continue to play a central role of the Defence Forces.

International Policeman?

Clausewitz famously said that "war is the continuation of politics by other means". Surely so, the modern role of the international soldier in peace keeping arena is the continuation of policing by other means. As such, controlled aggression and indeed an active mentality of peace keeping must be adhered to.



The Defence Forces, and indeed all armies, are not merely frontline soldiers looking down the sights of a barrel seeking a target, but also comprised of many support personnel. This role is all too often identified as the only role of reservists. The frontline soldier has also become much more that the operator of a weapon but also takes on the role of international negotiator, mediator, and facilitator in dealing with locals through day to day duties with civilians encountered in carrying out any mission. The eyes of the world

watch every soldier's every day act through the international forum of 24 hours news and internet blogs, and how he or she interacts with the community which they encounter is now the measure of a country and not only the individual soldier. The Reserves accordingly bring the skills of civilian interaction to the Defence Forces which is of enormous importance given the increased interaction of all armies with civilians rather than soldier to soldier interactions. In a civilian capacity each member of the Reserve encounters difference of opinion and beliefs which are becoming more and more common in this country and the world though multiculturalism. Orders barked from soldier to soldier may be accepted though not appreciated; civilians on the other hand may require more genteel treatment which may not be encountered on a day to day basis by members of the PDF. Indeed, Reservists being civilians for most of the year are uniquely placed within any army to view military-civilian interaction as this is largely the yard stick that reservists measure their own interaction with members of an army. This itself is a particular skill that should not be overlooked.

Armies across the world are growing to know that winning the hearts and minds of peoples is a most difficult task in comparison to the ease at which a single act of the lowest soldier can enrage a nation with terrible consequence. A careless word, a moment of displayed aggression, a moment of abruptness would go unnoticed in the heat of battle but in dealing with civilians in their own country will be remembered and recalled for generations. Reservists bring skills of employment that are constantly tested and challenged in the battlefield of the workplace and constant customer satisfaction.

Training within the Reserves focuses on the "attack" of any situation. The words of "destroying the enemy" are first to the mind in any mission. Reservists, like recruits, are taught controlled aggression as the means of problem solving as ultimately aggression of armed forces is the ultimate fall back for any political problem that cannot be resolved. In a push to militarise the Reserve through the focusing of parity of training and display of aggression on the battlefield, the Reserve must recognise that any imminent future foreign duties will be that of peace keeper. It is too often thought that the problem facing reservists is the lack of pure military skills and infrequent familiarisation with battlefield conditions. However, it often overlooked that reservists may be over keen to prove themselves in a battle that is not a battle, to display the gung-ho attitude displayed in war films, to over compensate for a lack of hours of duties by being over aggressive that may prove the true problems facing the Reserve in any future overseas missions. One must look with caution at the acts of the reserves in Abu Ghraib prison as a salutary tale.

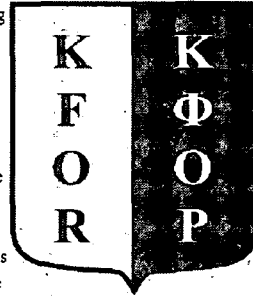
In looking at the training of the Reserves, careful analysis must be placed on the skills inherent within civilian soldiers and ensure that in providing them with the tools of battle that the very skills which make reservists of such value to army are not lost through an indoctrination of "seek out and destroy the enemy".

Suggested improvements and additional training that may be required for a company of reservists to be made available for an overseas peacekeeping mission such as KFOR.

Suggested improvements

Provision of adequate clothing and equipment

Often the reserves are not provided with even the basic clothing and equipment needed to undertake a mission. Having inadequate clothing and equipment greatly enhances the morbidity and mortality rate not only in combat situation but also in peace keeping missions and the training for such missions. Lessons need to be learned from missions where reserves were previously on active duty for example the marine reserves serving in Iraq. Some of these deficits came to light when a reserve marine Jonathon Wong was interviewed following his active duty in Iraq. He described how the reserves had to travel through a hostile area in open trucks as there were not enough armoured trucks, they were also desperately short of basic necessities such as ammunition and food.



Of course the equipment needed will depend upon the mission, for peace keeping depending on the role soldiers may be unarmed or lightly armed. Whatever about armament adequate clothing suitable for the terrain and climate will be required.

Maintain and where possible improve professional skills of RDF personnel

The RDF soldier is unique in that he or she is professionally qualified in his or her civilian life in the majority of cases. It would make sense for these skills to be used where possible on active duty. There are many examples of professions that could be used for peace keeping duties, re-building war torn countries, developing policies and procedures for the future, e.g. engineers, solicitors, doctors, nurses, dieticians, accountants, carpenters, electricians, mechanics, human resources. If the professions are not specific enough to requirements then perhaps funding should be made available for further education, there could be a clause attached that they sign a contract that they will be available for a specific time to provide the key skills required. This would help reduce the overall cost for the defence forces in that they would need to employ outside agencies less often when required for specific roles.

The RDF personnel would receive greater job satisfaction, it would help them to gain new knowledge and keep their skills up to date for when they return to their civilian employment. This would mean that they may be more sought after by their employers as they would perhaps have greater experience than those who have never worked abroad or on different

projects. The reserve himself/herself would possibly be more likely to volunteer for repeated missions.

Using the professional skills already attributed to the individual is something that the American reserve commanders are already looking at. They are looking for Army Reserve Soldier/Civilian Volunteers – Provincial Reconstruction Teams. The mission is to start in May 2007, its aim is to promote security, economic development and assist the Iraq people in rebuilding their country.

Adequate pay in line with the reserves civilian population.

It was found that some American army and marine reserves that went on active duty in Iraq actually had to take a pay cut in comparison to their civilian wage in some cases the reserve pay was grossly inadequate when compared to their usual wage. This situation poses a major problem; most reserves on active duty had their mortgage, car loan, life assurance etc based on civilian income. Monthly re payments will not be met if the pay falls short of what the usual income is. An evaluation carried out on the reserve marines who had served in Iraq found that 29% had pay decreased 10-50% while in 8% it was decreased greater than 50%. The picture for those who were self employed pre active duty was not any better, 83% reported that their business was somewhat or irreparably damaged. Worrying about financial security can only reduce the soldier's performance and enthusiasm for active duty. It is unlikely that RDF personnel would volunteer to a mission that is financially unviable.

There have been changes made to improve the finances of the US reserves and encourage participation in active service. Incentives such as a signing up bonus, increased college fund benefits and Army Emergency Relief (ARF) which provides financial assistance to families of reserves where there is a legitimate need are some of the initiatives.

Liasing with employers.

If RDF personnel are to serve overseas on active duty there would need to be active collaboration with employers. The soldier would need job security; some guarantee that he or she will have employment on returning from their duty. As well as having job security career progression needs to be clarified, does a person who leaves their employment know that this will not affect their chances of promotion? Initiatives can be taken from other reservists such as the US reservists. The American Department of Defence established the Employer Support for the Guard and Reserve (ESGR) in 1972. The ESGR aims to promote understanding and cooperation between the reserves and their employers. Supportive information for employers and policies for reserves on active duty have been developed.

In order for employers to comply, the benefits to the employer need to be emphasised, such as improved key skills, interpersonal experience, leadership qualities etc. Perhaps employers would need to be compensated in some manner.

Support services for troops and their families.

The transition from a reservist's civilian life to that of an active full time member of the defence forces is enormous and cannot be taken lightly. There needs to be proper systems in place to support the soldier and their family. Adequate time needs to be given so that the soldier and his family have time to do personnel administration. Some key areas to consider

Injury/Bereavements.

The possibility of getting injured on duty is a daily risk; injuries may affect the reservist's ability to work, study and if applicable support his or her family. Bereavement is not uncommon; to date 85 Irish soldiers have been killed on peacekeeping missions overseas. With these realities there needs to be support available such as counselling, financial security.

Legal considerations

Those going overseas should receive support to ensure that wills are made prior to deployment in case of bereavement.

Adjusting to civilian life

After returning from overseas, there will need to be a period of adjustment prior to recommencing civilian employment. This may not be required in all cases the level of support available will depend on the mission. The support may require counselling to be available if the reservist had to deal with traumatic situation. Basic support can be offered in the form of regular meeting where possible between those who served overseas.

The US reserves who served in the Iraq war had a number of support systems/groups in place; some of these could be adapted for use with the Irish reserves examples include;

- Army Reserve Family Support Information and Resources (ARFP)
- Army Morale, Welfare and Recreation (MWR)
- Department of Defence Affairs Publications
 - Available benefits.
 - Parents guide to military service.
- Active Guard Reserve
 - Medical care for soldier and their family

There are some reserve specific incentive/policies in place;

- Army Reserve Education

- Student loan repayment scheme programme
- Officer cadet school scholarships
- Virtual University

- Army Reserve readiness Training Command.

Recruits go to recruit camp every year with the RDF, to my knowledge no formal written information is given to the family or even the recruit as to what the recruit camp will involve and what will be expected of the recruit.

Moral Esprit de corps.

In order for any mission to be successful the moral and esprit de corps of the unit needs to be maintained. In a Spanish documentary about the reserve marine corps on active duty in Iraq it was very obvious that the moral was extremely low. The reserve marines did not know or lost sight of their mission/objectives which at times led to a reduced performance and also to lack of tolerance for the local population.

Poor or low moral leads to an inadequate performance by soldiers and threatens mission success. It is imperative that soldiers serving overseas have a clear and concise objectives/mission. The current objectives/mission for peacekeepers serving with KFOR is;

- Establish and maintain a secure environment in Kosovo, including public safety and order.
- Monitor, verify and when necessary, enforce compliance with the conditions of the Military Technical Agreement and the UCK Undertaking.
- Provide assistance to the UN Mission in Kosovo (UNMIK), including core civil functions until they are transferred to UNMIK.

A mission such as above provides a clear role for the soldier to aim to achieve, it also allows for a certain amount of flexibility within the objectives.

Evaluation.

An evaluation of all aspects of military life for the reserve soldier is necessary to highlight areas that need to be improved or to retain practices that work. The evaluation should be confidential and cover a wide range of topics to include, finance, specific support needs, clothing and equipment training and adequacy, family support. The evaluation should not be bias and should leave space for the soldier to note any change/s that would improve active duty overseas. As the RDF have not yet served overseas a base line evaluation of current training needs and requirements could be done to give fore warning of the needs before a mission for overseas becomes available.

Additional Training Requirements:

Adaptation Training

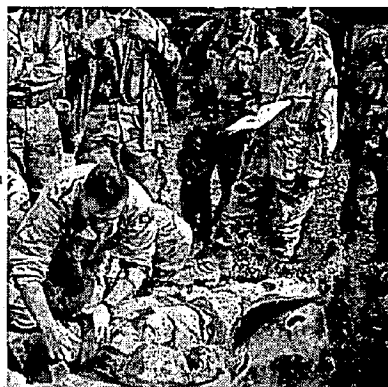
Adaptation training would allow the RDF soldier to prepare for overseas missions. It would cover some of the areas initially discussed such as learning about the history, culture and religion of the country where the mission occur. Peacekeeping is different to normal tactical operations and the RDF would need to have specific training in this area. The company to serve overseas will not be exclusive to either the RDF or PDF or indeed limited to one unit. The company may be formed by members of both defence forces from all over Ireland. If the company is to operate cohesively while overseas it will have to be trained and integrated together from the start. In some ways this has already started to occur on a smaller, but significant scale with the integration of an RDF platoon with a PDF company in the 4th Western Brigade.

Close Combat Training and FIBUA

Depending on the peacekeeping mission the overseas may only be lightly armed if at all. The soldier may have to rely on basic but essential methods of self defence. The teaching of self defence is not routine in the RDF and this would need to be addressed.

Basic first aid and life support

It was also noted in the Spanish documentary mentioned earlier that the level of first aid required by the reserve marines was high however they seemed to rely on the one doctor. All soldiers should be trained to have a good knowledge of basic first aid and life support. Medical kits should be carried by all personnel and they should know how to use it. There are of course medical professionals in the RDF who are qualified in their civilian occupation as such. These individuals should be requested to impart some basic knowledge or where possible organise a first aid course for the other members of the RDF. These people should not just be ordered to teach their skills but should be given some recognition for doing so.



Physical fitness training

Physical fitness needs to be the core of any training undertaken by RDF personnel. There are large gaps in the physical ability of serving members. With the introduction of fitness tests the situation is improving but there is still a long way to go. Physical training needs to be

incorporated at the start of recruit training and maintained throughout service, not just something that is done to pass life tests. The recognition of civilian qualifications in fitness would be a great step, also running more PTL courses and moving on to stage 2 PTS as many who have completed part 1 a number of years ago still have not had the opportunity to complete part 2, the skills previously learned are most likely outdated which is a wasted resource.

Adapt civilian skills to army needs.

It is great to have so many skilled persons in the RDF with civilian qualifications, however many of these skills will need to be adapted in order to be useful within a combat or peacekeeping situation. Further training in the soldier's professional area will need to be provided by members of the PDF or funding provided for further education. The person receiving further training may have to sign an agreement/contract so that he/she will be available to provide the specific skill when required, or for a specific time period post qualification.

8.4. Post-Study Survey

8.4.1. Sample of post-study survey

MSc LT - WebQuest Questionnaire (Post-Course).doc

Created by Lt John Lally



MSc Learning Technologies WebQuest Questionnaire – Post-Course

**To ensure improvement for future courses please
complete this feedback form. DO NOT mark this form with
your name or number.**

Instructions:

The purpose of this survey is to help develop an understanding how your opinions of eLearning may have changed after completing this course.

Please complete this questionnaire answering the questions as accurately as possible. We are interested in your honest answers both positive and negative. Please answer ALL of the relevant questions; all information provided will remain CONFIDENTIAL. Your carefully considered responses will help to improve the way eLearning is presented in the future.

Please tick your response to the items presented. Rate aspects of the module on a scale of 1 to 5 where 1 = "Strongly Disagree" and 5 = "Strongly Agree". Choose "N/A" if the question is not appropriate or not applicable to you. Your feedback is sincerely appreciated. Thank you.

Introduction:

Q1. What is your gender? Male Female

Q2. What is your age group? <20 21-25 26-30 31-35 36-40 40+

Q3. Which of the following statements best describes you?

- I learn best when working alone and thinking through problems and concepts myself.
- I learn better when working alone in some situations.
- I learn equally well when working alone and when discussing concepts and problems with others.
- I learn better when discussing concepts and problems with others in some situations.
- I learn best when collaborating with others and discussing concepts and problems with them.

The use of technology in learning (general – non-military):

Q4. Which of the following best describes your preference with regard to the use of technology?

- I prefer taking classes that use no information technology.
- I prefer taking classes that use limited technology features (PowerPoint presentations).
- I prefer taking classes that use moderate level of technology (email, presentations, some online activity).
- I prefer taking classes that use technology extensively (online lecture notes, computer simulations, live video/audio).
- I prefer taking classes that are delivered entirely online.

N/A = Not Applicable; 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree Nor Disagree; 4 = Agree; 5 = Strongly Agree

Q5. I spend more time engaged in course activities in those courses that require me to use technology. N/A 1 2 3 4 5

Q6. The use of technology in my classes meets my expectations. N/A 1 2 3 4 5

Q7. The instructor's use of technology in my classes can increase my interest in the subject matter. N/A 1 2 3 4 5

MSc LT - WebQuest Questionnaire (Post-Course) doc

Created by Lt John Lally

- Q8. I find that I get better grades in courses that use IT. N/A 1 2 3 4 5
- Q9. The use of IT in class helps me better understand complex or abstract concepts. N/A 1 2 3 4 5
- Q10. The use of IT on courses helps me better communicate with the instructor. N/A 1 2 3 4 5
- Q11. The use of IT on courses has resulted in prompt feedback from my instructors. N/A 1 2 3 4 5
- Q12. The use of IT on courses helps me communicate and collaborate with my classmates. N/A 1 2 3 4 5
- Q13. The use of IT on courses provides more opportunities for practice and lesson reinforcement. N/A 1 2 3 4 5
- Q14. Classes that use IT allow me to take greater control in my class activities (e.g. planning, studying etc.). N/A 1 2 3 4 5

The use of technology in learning (military):

N/A = Not Applicable; 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree Nor Disagree; 4 = Agree; 5 = Strongly Agree

- Q15. Overall, I enjoyed experience using a course management system. N/A 1 2 3 4 5
-
- Q16. Would you be willing to use an learning management system for future courses? Yes No

For each of the online features used in the class, how did these features improve your learning or your ability to manage your activities?

N/A = Did not use; 1 = Strong negative effect; 2 = Negative effect; 3 = No effect; 4 = Positive effect; 5 = Strong positive effect

- Q17. Course content. N/A 1 2 3 4 5
- Q18. Online reading and links. N/A 1 2 3 4 5
- Q19. Discussion boards. N/A 1 2 3 4 5

Q26. How would you least like to receive training material for future courses?

- Printed notes.
- Online.
- Initially online but followed with a traditional class to reinforce the material
- In a traditional classroom.
- Other (please explain)

Development of higher order thinking skills:

N/A = Not Applicable; 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree Nor Disagree; 4 = Agree; 5 = Strongly Agree

- | | | | | | | | | | | | | | |
|---|---|--------------------------|--------------------------|--------------------------|--------------------------|---|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Q27. Having completed this course I see a value in developing higher order thinking skills (Analyses, Synthesis and Evaluation). | <table border="0"> <tr> <td>N/A</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> | N/A | 1 | 2 | 3 | 4 | 5 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| N/A | 1 | 2 | 3 | 4 | 5 | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | | | |
| Q28. I believe the proper use of technology creates a successful environment to develop higher order thinking. | <table border="0"> <tr> <td>N/A</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> | N/A | 1 | 2 | 3 | 4 | 5 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
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| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | | | |
| Q29. I believe that I am capable of applying technology to develop higher order thinking. | <table border="0"> <tr> <td>N/A</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> | N/A | 1 | 2 | 3 | 4 | 5 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| N/A | 1 | 2 | 3 | 4 | 5 | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | | | |
| Q30. I believe I am capable of conducting effective research on a given topic. | <table border="0"> <tr> <td>N/A</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> | N/A | 1 | 2 | 3 | 4 | 5 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| N/A | 1 | 2 | 3 | 4 | 5 | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | | | |
| Q31. I believe I am capable of analysing information and identifying its key components. | <table border="0"> <tr> <td>N/A</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> | N/A | 1 | 2 | 3 | 4 | 5 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| N/A | 1 | 2 | 3 | 4 | 5 | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | | | |

Q32. What did you find most helpful to your learning?

.....
.....
.....

Q33. What did you find most hindered your learning?

.....
.....
.....

*N/A = Not Applicable; 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree Nor Disagree;
4 = Agree; 5 = Strongly Agree*

Q34. I believe there is value in developing higher order thinking skills in the military?

N/A	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q35. At what level of training should higher order thinking skills be taught to students?

- Private.
- Junior NCO.
- Senior NCO.
- Junior Officer.
- Senior Officer.

Q36. In your opinion what is the most important reason for developing higher order thinking in the military?

.....
.....
.....

*N/A = Not Applicable; 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree Nor Disagree;
4 = Agree; 5 = Strongly Agree*

Q37. The use of collaboration helped to develop my understanding of the subject.

N/A	1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q38. What problems did you find when collaborating with your fellow students?

Q39. If given the option of individual or group study for a project which would you prefer? Individual Group

Q40. Please explain why you selected that option?

N/A = Not Applicable; 1 = <= 2; 2 = <= 3; 3 = <= 4; 4 = <= 5; 5 = 5 >

Q41. In your opinion what is the optimum size for a collaboration group? N/A 1 2 3 4 5

Summary:

Q42. What other comments would you like to add to this survey?

Q43. Would you be willing to participate in further technology in learning experiments? Yes No

Q44. May I contact you to gather further information based on your responses? Yes No

Q45. What is your preferred method of contact?

- Not Applicable.
- Telephone.
- VoIP.
- Email.
- Letter.
- Face-to-face.

WebQuests: A scaffolded learning structure to develop higher order thinking

8.4.2. Post-study survey raw results

Introduction		The use of technology in learning (General - non-military):					The use of technology in learning (Military):				
Q1. What is your gender?		Male		Female		Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Q2. What is your age group?		<20	21-25	26-30	31-35	35-40	40+				
Q3. Which of the following statements best describes you?		I learn best when working alone and making notes in my notebook	I learn best when working alone and with others discussing concepts and problems with them.	I learn best when I learn alone with lecture notes, concepts and problems with others.	I learn best when I learn alone with lecture notes, concepts and problems with others. I discuss concepts and problems with them.	I learn best when I learn alone with lecture notes, concepts and problems with others. I discuss concepts and problems with them. I learn best when I learn alone with lecture notes, concepts and problems with them.					
Q4. Which of the following best describes your preference with regard to the use of technology?		I prefer taking classes that use no information technology.	I prefer taking classes that use low-level technology (email, Powerpoint, etc.)	I prefer taking classes that use moderate level technology (video, lecture notes, concepts and problems with others).	I prefer taking classes that use high-level technology (video, lecture notes, concepts and problems with others).	I prefer taking classes that use high-level technology (video, lecture notes, concepts and problems with others).					
Q5. I spend more time engaged in course activities in those courses that require me to use technology.		Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree				
Q6. The instructor's use of technology in my classes meets my expectations.		Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree				
Q7. The instructor's use of technology in my classes can increase my interest in the subject matter.		Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree				
Q8. I find that I get better grades in courses that use IT.		Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree				
Q9. The use of IT in class helps me better understand complex or abstract concepts.		Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree				
Q10. The use of IT on courses helps me better communicate with the instructor.		Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree				
Q11. The use of IT on courses has resulted in prompt feedback from my instructors.		Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree				
Q12. The use of IT on courses helps me communicate and collaborate with my classmates.		Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree				
Q13. The use of IT on courses provides more opportunities for practice and in-classroom feedback.		Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree				
Q14. Classes that use IT allow me to take greater control in my class activities (e.g. planning, studying etc.)		Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree				

Not Applicable = 1, Strongly Disagree = 2, Disagree = 3, Neither Agree nor Disagree = 4, Agree = 5, Strongly Agree = 6

Q29. I believe that I am capable of applying technology to develop higher order thinking.

Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q30. I believe I am capable of conducting effective research on a given topic.

Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q31. I believe I am capable of analyzing information and identifying its key components.

Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q32. What did you find most helpful to your learning?

Q33. What did you find most hindered your learning?

Q34. I believe there is value in developing higher order thinking skills in the military?

Q35. At what level of training should higher order thinking skills be taught to students?

1	2	3	4	5
Private	Junior NCO	Senior NCO	Junior Officer	Senior Officer

Q36. In your opinion what is the most important reason for developing higher order thinking in the military?

Q37. The use of collaboration helped to develop my understanding of the subject.

Q38. What problems did you find when collaborating with your fellow students?

Q39. If given the option of individual or group study for a project which would you prefer?

Individual	Group

Q40. Please explain why you selected the option?

Q41. In your opinion what is the optimum size for a collaboration group?

Q42. What other comments would you like to add to this survey?

Q43. Would you be willing to participate in further technology in testing experiments?

Yes	No
6	3

Q44. May I contact you to gather further information based on your responses?

Yes	No
6	3

Q45. What is your preferred method of contact?

Not Applicable	Telephone	2
	VHF	5
	Email	6
	Letter	7
	Face-to-Face	8

Summary:

Q46. I believe that I am capable of applying technology to develop higher order thinking.

Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q47. I believe I am capable of conducting effective research on a given topic.

Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q48. I believe I am capable of analyzing information and identifying its key components.

Not Applicable	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q49. What did you find most helpful to your learning?

Q50. What did you find most hindered your learning?

Q51. I believe there is value in developing higher order thinking skills in the military?

Q52. At what level of training should higher order thinking skills be taught to students?

1	2	3	4	5
Private	Junior NCO	Senior NCO	Junior Officer	Senior Officer

Q53. In your opinion what is the most important reason for developing higher order thinking in the military?

Q54. The use of collaboration helped to develop my understanding of the subject.

Q55. What problems did you find when collaborating with your fellow students?

Q56. If given the option of individual or group study for a project which would you prefer?

Individual	Group

Q57. Please explain why you selected the option?

Q58. In your opinion what is the optimum size for a collaboration group?

Q59. Would you be willing to participate in further technology in testing experiments?

Yes	No
6	3

Q60. May I contact you to gather further information based on your responses?

Yes	No
6	3

Q61. What is your preferred method of contact?

Not Applicable	Telephone	2
	VHF	5
	Email	6
	Letter	7
	Face-to-Face	8