A collaborative learning environment is the essence of the adult learning experience. Understanding dependency and direction is essential for the professional educator to succeed by inspiring learning and building new knowledge.

Collaborative Learning Cultures

Collaborative Learning Progression

William A. Salmon, BSLA – LLC (© 2003)

Collaborative Learning Cultures

Learning Culture Abstract

Motivation

During my Jones International University Masters of Education experience, I've become very aware of how vital it is for educators of adults to understand their approach to planning, design, and implementation of instruction. I've focused on the fire service as an educational model, and believe many pedagogical methods are employed when Andragogical methods would be more effective. In my "Learning Culture" guide, I attempt to find a way to show how these methods are effective for fire service education.

Problem statement

I have borrowed from many JIU courses to identify how we as educators of fire service adults can provide well designed curriculums and deliveries that complement their individual learning needs and levels. Many times I've watched instruction of fire service adults being delivered from a high- direction and high-dependency approach. These kinds of methods certainly have their place, but much research exists to provide a much more effective method of instructing adults.

Approach

I took the concepts from adult learning theory, complexity science, instructional design, and other research to design a Learning Culture Guide. This guide is meant to help the fire service educator identify how to plan, design, and facilitate adult learning within a Fire Service Learning Culture.

Results

I designed a Collaborative Learning Progression (CLP) chart, which details two progressions between learner and instructor. The first, a collaborative learner progression, details learners without knowledge or experience of the material. These learners need much direction, and are dependent on the instructor for their success. This typically represents the fire service recruit firefighter's first few months. As

recruit firefighters progress through the first few weeks of a introductory academy, they begin to acquire knowledge and experience. This new knowledge and experience can allow the instructor to modify their instructional approach to become more of a facilitator -- allowing the recruit to have the manipulation space to experiment with the material for themselves. This progression is detailed on Chart 4.1 of my EDU669 project.

The second collaborative learner progression details learners who have developed into mid or advanced career knowledge status. In their careers they have a constant need for updated information, whether it is from new paradigms, technology, information, or procedures. The CLP shows how these incumbents may revert back to needing high direction and being highly dependent on the instructor. Because they come into the learning environment with different levels of knowledge, the time frame from high-direction and high-dependency to the instructor moving into the facilitator role will depend upon how well they add this new knowledge to their existing knowledge. Eventually, the goal is for the instructor and learner to become collaborative learners.

Conclusions

I have presented these concepts to many peers in the fire service, with very positive comments and encouragement. I've implemented these concepts while developing learning environments for US and Mexican fire departments with proven success. In the end, the true measure of learning is whether those involved can apply their new knowledge in novel situations.

Introduction

Vision and Mission for this Learning Culture Project

My mission for developing a guide from a Training Culture to a Learning Culture is to focus on the need for both educators of firefighters, and the firefighters themselves, to move toward the realization and methods of instruction planning, development, delivery, and assessment that reflects the latest Andragogical models. These Andragogical models promote the importance of the learner as center, and the teacher/instructor as support as a facilitator and collaborative learner.

My vision is to develop this Learning Culture guide as a means for furthering the enculturation of fire department learning environments, by the understanding of how we learn, who is responsible for learning, and how fire service training personnel can design learning environments. The desired end state is that firefighters become indoctrinated into a learning culture which promotes them seeking their own learning throughout their careers. The hope is their problem solving skills will transfer across learning domains where they are able to use this knowledge transfer for problem solving in novel situations.

Why this Guide?

Almost every organization, fire service or other, faces the challenge of educating and updating the education of their employees. This guide will focus specifically on fire service as one specific and complex educational model.

Collaborative Learner Progression

Instructor Role & Learner Dependency Matrix

Andragogical

0% Dependency

Learner: 100 % Dependency on Instructor

Pedagogical

Career Progression

Continuing Education

Beginning of Fire Service Career

Learning Needed for New Paradigms or Technologies

Mid Fire Service Career

Adds to existing schema and builds upon existing knowledge – low road knowledge transfer within similar contexts

Advance Fire Service Career

Complexity Thinking – high road knowledge transfer in Novel Situations

Instructor Role : Requires Maximum Instructor Direction → **Instructor shifts into Facilitator Role** → **Instructor and Student as Collaborative Learners**

Chapter 1

Rationale for the Learning Culture project

In 2006, as the Poudre Fire Authority (PFA) Training Captain responsible for planning and developing new and continued fire service training to 36 fire companies (basic work unit of the fire service - 3 to 5 people on a company), I conceived of the need for changing the existing educational model (Pedagogical model) of how training was developed and delivered at the Poudre Fire Authority. Basically, changing from a Pedagogical-Objectivist training culture to a Andragogical-Constructivist learning culture. Using Andragogical and Constructivist models, I developed a series of 7 web pages in support of 18 educational subject domain offerings via the PFA Intranet. These web pages were followed-up by 258 field constructive learning environments (CLE). (Appendix C).

Previously, the educational model was to develop and deliver one class at a time. The training division, or an instructor with subject matter expertise, developed a class in the form of an outline, Power Point, and/or multimedia. These courses were delivered 12 -18 times, over 3 days to fire companies. This necessitated the movement of 36 companies, and the focus was on the instructor (Objectivist-Pedagogical Model) to deliver class and practical materials at each class. Because this model emphasized the instructor as the main source of information, which made it very time intensive, only a very few classes were developed each year for delivery. Most were not professionally developed with lesson plans which detailed learning goals, outcomes, and objectives.

The 7 web pages I developed in 2006 included a facilitator's guide. This guide was a detailed lesson plan which included learning goals, outcomes, and specific

objectives to accomplish the goals and learning outcomes. The CLE's that followed these web pages were a mirror image of the web facilitator's guide. The primary reason for developing the facilitator's guide as part of the website offerings was to give a professionally developed lesson plan, and guide, to the fire company captains who are the primary instructor's for their crews.

For each domain offering produced by the PFA training division, the battalion chiefs and captains were advised they were not <u>required</u> to attend the training division facilitated CLE's. They would be able to construct their own learning utilizing the online facilitator's guides. PFA has approximately 150 firefighters, many who are on vacation, sick, or on emergency responses, during the times when these CLE's were delivered by the training division. It was imperative the company captain would be able to provide the make-up training for their firefighters who missed the scheduled classes.

Statement of purpose

My Capstone Project purpose is to create a document which can be primarily utilized by fire service personnel that details how to move from a culture where the focus is on the trainer, to one where the focus is on the learner, and to where the academic principles of Andragogical educational theories (as adult learners) are the focus. I propose to substantiate the assumption is true that fire service training is initially a pedagogical model, which becomes an Andragogical model as firefighters develop past recruit status. There are components of this project document that may fit both models, especially when new paradigms or technology are introduced during classes.

In the fire service, the primary provider of instruction, the company officer, is not an educational professional. Therefore there is a significant need for academically proven subject domain information that is available to help these front line educators. My attempt to provide this domain information utilized Web and hyperlink technology to build subject domain information web pages. These web pages include facilitator's guides that lead the officers through instructing and facilitating learning with their crew members, followed up by constructive learning environments. The web page domain information, facilitator's guides, and constructive learning environments are the basis of my Training Culture to Learning Culture (LC) project.

Educational and practical relevance

As a fire service educator, I have observed -- through many planning sessions and course deliveries -- how difficult the planning and implementation of training has become for most fire organizations. As any organization has dynamics specific to their discipline, the fire service has an extremely critical need to gain new knowledge in literally dozens, if not hundreds, of subject domain arenas. As I pursued my M. Ed. curriculum an apparent pattern began to develop in my mind that focused on the Androgogical theories espoused by Alexander Kapp and Malcolm Knowles. (http://en.wikipedia.org/wiki/Andragogy).

Specifically, my belief that most fire service educators don't consciously understand the dynamic difference between a Pedagogical or Andragogical model, and who has the power and responsibility for how instruction and learning takes place. I've focused also on the predominant educational theories, and I've chosen the Constructivist

theory of education as my main delivery model in direct support of these Andragogical concepts.

Target population and learning community

My target audiences for this "Training Culture to Learning Culture" project are the officer's who supervise and educate fire service personnel, acknowledging the primary educator is the fire company officer. A change in culture is essential to empower the company captain as a facilitator of collaborative learning, by supporting the development of this learning culture.

The PFA serves a population of approximately 150,000 people, and covers a geographical size of 235 square miles. The PFA is comprised of twelve career fire companies, operating from three 24 hour shift schedules, for a total of 36 fire companies. The minimum manning for the PFA is 126 online firefighters, with the actual number usually being approximately 140 - 150. There are 10 support firefighters and officers that are spread between fire prevention, training, and the office of emergency management.

My Second Relevant Learning Culture: Cozumel Mexico Fire Department Training

Beginning in 1998, I began formal fire service education to the firefighters of the island of Cozumel, Mexico. In 2001 we began inviting other firefighters from the surrounding cities of Quantana Roo State: Cancun, Playa Del Carmen, Tulum, Chetumal, and various airport and military firefighters to an annual fire academy. It has been during these Mexican fire academies where I've witnessed the power of the Andragogical models. In 2007, we will conduct our 9th Bombero (firefighter) Academy.

Initially, I found myself very inept at the technical Spanish language to instruct the very technical and dynamically changing environment that defines the fire service as a peculiar learning model. By utilizing interpreters to impart my lesson plans, I found the only way to accomplish this effectively was to immediately establish an incident command system (ICS), and teach through this ICS using the commanders and officers to facilitate the training. Quite by accident this became my preferred method of instruction, whether in the US or Mexico.

This learning model we were using put the focus back on the learner, being one level removed from the instructor as the focal point. Both pedagogical and Andragogical methods were and are employed during our training of Mexican firefighters. We would typically begin with some form of formal class -- initially a pedagogical model -- that stressed the instructor having the information that they needed. It soon developed into imparting well translated documents that they could read as I covered the high points with the interpreters. Once they had the proper domain information in their language, they were able to construct their own learning as the class progressed. Eventually they were well within an Andragogical model, where the instructors were facilitators in the collaborative learning of the firefighters.

Due to the language barrier, I was unable to converse on a deep personal level, beyond what the interpreters were capable of translating. This barrier allowed me to stand back and watch the interactions of the men, instead of how they would be relating to me if I were talking to them directly. They responded to the ICS that was in place, and we built on that leadership by asking the company officers to critique with their crews and relate their input of what they learned to the entire class. This facilitation gave the

class many hours of clarification and understanding that I do not believe would have been shared had this not been the case.

As our team of fire service instructors and professional interpreters has grown, so has our understanding how our Andragogical-Constructivist Learning Culture model has impacted our training in Mexico. We are currently developing a website where solid domain information will be posted, complete with facilitator's guides, pictures and multimedia to support their constructive learning environments.

Enculturation of our Mexican firefighters into a Learning Culture is an essential goal for these firefighters to continue to develop. This is simply because there are no sustainable models for them to receive consistent modern firefighter education and training. They must become comfortable with the premise that by acknowledging, as adult learners who intrinsically desire to have the responsibility and control over their learning, this is how they will plan to learn. Future Course offerings they receive, whether in a Pedagogical or Andragogical model, will be designed to enhance their own responsibility to learn. A significant part will be understanding, and adapting to, instructors who don't possess adequate adult learning mindsets or skills.

Chapter 2

What do I mean by a Learning Culture?

The learner-centered Learning-Culture model (Andragogy) differs from the instructor-centered Training-Culture model (Pedagogy) in how those involved in course design and delivery view their roles. The Learning Culture Instructor/Facilitator is responsible for instructing from the Andragogical point of view, where the adult learner's desires to responsible for their own learning are validated. From initial contact with students, the instructor's give power messages to their students that prep them to be more mindful, and to have total ownership of their learning outcomes. As Knowles (2005) describes, there is now a belief that better outcomes come from "preparing the learner" (p. 117). This change from a student expecting to be educated by a teacher, to being empowered to own their own learning, is sometimes painful for both the instructor and student. I'll cover this more in detail in the learning theory chapters.

This model of fire service Learning-Culture emphasizes learning can be accomplished by setting learning goals, and by making valid domain information, facilitator guides, and constructive learning environments available to learners. Most times these constructive learning environments will need to be facilitated by knowledgeable and trained facilitators. The end result can be excellent in supporting the learning culture, with

As Knowles (2005) describes, there are times when the more traditional approach (Pedagogical) is appropriate: "If a pedagogical assumption is realistic for a particular learner in regard to a particular learning goal, then a pedagogical strategy is appropriate, at least at the starting point" (p. 69). Even though this learning culture model may start

out in a pedagogical mode, where the learners |"are dependent" (Knowles, 2005, p. 71) it should transition into an Andragogical mode as the learner develops more depth of knowledge in the subject being presented.

From the beginning, depending upon the knowledge base of the student, the focus of responsibility should be on the learner to add new knowledge to their existing schema. Empowerment of the learner encourages questioning and owning of their understandings, in context and content, towards an ability to have this new knowledge transfer in novel situations for problem solving.

As Knowles (2005) describes, the early understanding of Andragogical principles didn't take into account the valid need for The instructor/facilitator's are truly learning guides, and should be very informed and skilled in what subject is being taught. Their skill will keep those involved from bogging down, but they lead the student's through problem solving exercises that encourage knowledge from other domains to transfer while seeking solutions for constructive learning environment problems.

According to Ellen Langer (1997), educational models which focus on the teacher/instructor to impart new knowledge to the learner, especially if the subject is presented using "conditional or absolute language" as the way to do something, have shown less ability to transfer in novel situations toward problem solving (Langer, 1997, p. 21).

Chapter 3

Pedagogy and Andragogy, what is it?

The term Pedagogy is traditionally used to describe the teacher and student relationship, and is generally thought of as adult to child. Pedagogy represents a more rigid power relationship, where the teacher has the knowledge and the child (student) needs this knowledge. The teacher will attempt to educate the child with very little consideration for what the child already knows.

I contrast, Andragogy, as developed by Malcom Knowles, et al, and their predecessors, focuses on the differences between adult and child learning. Adults, according to Knowles, et al (2005), places value of experience in their lives at a premium, and that "authoritative teaching, examinations which preclude original thinking, rigid pedagogical formulae – all these have no place in adult education" (p. 37)

Knowles, et al (2005), defines the six principles of Andragogy as: "(1) The learners need to know, (2) Self-concept of the learner, (3) prior experience of the learner, (4) readiness to learn, (5) orientation to learning, and (6) motivation to learn" (p. 3).

The strength of Andragogy is that these core principles work best when the context of the training environment is considered, and the learning environments tailored to allow these principles to work for learning acquisition by the learner.

In the Andragogical view of adult education, the focus is not on educating, which is more educator centered, but on the learning, which is learner centered. This change in focus is at the heart of a learning culture. The teacher's role is a more collaborative effort as both the teachers and adult-students "are searchers after wisdom and not oracles:" (Knowles, 2005, p. 38).

This is an important distinction for those developing and delivering training programs or courses to fire service personnel. Again, Knowles, et al (2005), clarifies that the effectiveness of Andragogical principles does not come from applying the theory to the situation. But by recognizing the contexts that the learning will take place within, and applying Andragogical principles to it.

An example that I used in 2006 of taking into consideration the context, then applying the Andragogical principles to that context was: When designing the July, 2006, Poudre Fire Authority Driver Operator (D/O) skills learning environment. The context was going to be a rural water pumping situation, where the drivers were to pump their own fire engines, from lake water.

There are many ways to present this, and I chose to relay heavily on the six Andragogical principles to complete the training in a very short time period – 45 minutes per station (2 stations per engine). In a Pedagogical model(teacher imparts knowledge to student), this same learning would require 2 – 4 hours. I'll address each of the Knowle's Andragogical -- six core principles, and how and why I developed this learning environment for PFA.

(1) <u>The learners need to know</u>: My target audiences for the July D/O skills were the incumbent Driver Operators for the Poudre Fire Authority. These drivers are required to complete an annual skills packet. They also are very motivated to be skillful as driver operators, thus they needed to show competency as part of a required, and personally important training event.

(2) Self-concept of the learner: The training consisted of two separate scenarios, which required them to place their fire engine in a defined location, attach numerous hoses and appliances, and then perform the tasks as presented. These learning environments were prefaced by acknowledging that each driver was skillful, and this was an opportunity to learn from each other. The company captain was requested to be the primary facilitator for their company. No pressure was placed on the learners from our training staff. We were to be facilitators and resources for them to gain new knowledge from the learning environment. They were allowed to act autonomously as a fire company to construct their own learning.

(3) Prior experience of the learner: This rural water training was being performed in a novel location, under novel conditions. All the D/O's and crews should have had prior knowledge of how to perform all the requested events.

To enhance their prior experience, I built a web page to support this learning environment. Included were pictures of the training area, and a facilitator's guide. The facilitator's guide was to be used by the company to preview the required events, or for facilitating their own learning environment if they were unable to participate on their assigned date and time. This web page environment was the solid domain information that was to support the constructive learning environment.

They also would be performing the requested rural water pumping exercises as a fire company, not as an individual. Crews were encouraged to assist each other and benefit from other's experience.

(4) <u>Readiness to learn</u>: Our hope was that by providing the constructive learning environment that was completely in place, the companies could focus on their operations within the environment. We felt that by asking them to set up and tear down the equipment they would not have the time or energy to actually work the performance of the pumping skills. The data collected, via Surveymonkey.com, from all PFA firefighters who participated, and our observations, validated this learning environment supported their readiness to learn.

(5) <u>Orientation to learning:</u> In our rural water pumping learning environments, the D/O's were given very relative and real life problems. We had a monitor (flows 500 gallons per minute) set up to flow a defined amount of water, just as they might find on a fire scene. It was realistic, and, they had to perform the skill to experience the positive result. In many cases they didn't perform well, but these were significant learning moments for all involved. Since these learning environments were in the context of a real world environment, the data collected revealed high self-efficacy from the D/O's that they could perform each function in a novel situation.

(6) <u>Motivation to learn</u>: Most of the D/O's and their crews were very engaged and actively working the learning environment scenarios. This was most likely the result of them being able to work a relevant scenario which replicates what they could face in their everyday response situations. We observed no lack of motivation, and the data validated a high degree of satisfaction with the learning environments for the July pumping skills (Appendix C).

Chapter 4

Adult Learning Theories: The collaborative Learner Progression

The study of learning and teaching has been captured well by Knowles, et al (2005), where there are "theories of teaching" (p. 104) and "theories of learning" (p. 28). Knowles (2005) quotes Gage, (1972, p. 56) when describing the difference between a learning theory and a teaching theory: "Theories of learning deal with the ways in which an organism learns, whereas theories of teaching deal with the ways in which a person influences an organism to learn" (p. 73). Understanding these differences will help us make better choices as teachers/facilitators and students.

In the fire service we are constantly faced with many challenges to both, initially train new recruit firefighters, and to provide consistent and sustainable continuing education in a multitude of subject areas. The advancements in technology, as well as requirements for continuing education, requires a fresh look at how the fire service prepares all levels of firefighters to learn during their fire service careers.

The fire service is a traditional para-military environment, which requires adherence to a "chain of command" type atmosphere. If the chain of command, and it's autocratic nature, isn't managed within the learning environment, there is a risk to have students focus on performance goals, not on learning goals. The difference being a performance goal is just that, to perform. Their performance motivation may be to not have the instructor yell at them in a training environment, instead of focusing on mastering the subject of the learning goal.

Chart 4.1, (Knowles 2005, 196) is adapted from "Pratt's (1998) model of high and low direction and support." shows the Collaborative Learner Progression. This

progression reflects the Andragogical nature of adults that was discussed in chapter 3. Adults want to be responsible for their own learning, and they want to be involved in the planning of what they will learn. Even though adults want to be responsible for their own learning, they still need the direction or guidance of a teacher under certain circumstances.

Chart 4.1, shows two points on the progression where a learner will need much direction from the teacher. When a fire service recruit first enters the fire service, and when there is an opportunity for experienced firefighters to learn a new skill where they have little previous knowledge. The latter category can pertain to new technologies, paradigm shifts, new standards, or other subject areas where they lack the relative knowledge to perform.

New recruits customarily either attend a training academy (depending upon jurisdictional policies, which may be 12 -20 weeks in length), or receives on the job training (OJT) from their department. If the autocratic para-militaristic mindset of the instructors is allowed to permeate the full length of an academy, there may be significant opportunities for growth and insight which may be lost. Initially, the recruits will require much direction and correction to ensure they understand the concepts. By the instructor's transitioning into facilitator's, then into collaborative learners, the students will have the opportunity to (without fear) try out what they've learned. It isn't reasonable to expect recruits to have fully developed schema, leading to high road transfer in novel situations. It is however reasonable to expect them to have built new schema onto their limited prior knowledge of the learning subjects. This new knowledge hopefully may lead to low road transfer in similar contexts.

How well the learner is able to retain new information and perform depends upon the preparation of the learner to be mindfully engaged, the learning environment, and cognitive load of the learners. This preparation to be mindful, and send collaborative learner messages, should be the instructor's responsibility. In fact, Knowles (2005) describes how adults exposed to andragogical adult education models often times "experience a form of culture shock" (p. 117). Knowles, (2005), states that in 1995 he added "preparing the learners" to his process elements, as the first of eight elements (p. 116).

The next consideration of Chart 4.1 is the continuing education of incumbent firefighters as they develop throughout their careers. If you assemble a group of fire company officers, one consistent theme which seems to surface in discussion is the apprehension which comes from the thought of training their own firefighters. I believe this apprehension emanates from their only model of instruction being pedagogical. They treat their firefighters like children, and they are the teacher. What Knowles, (2005), et al, have shown to be a much more effective method is the collaborative learner process. If these officers approach their firefighters to suggest or solicit topics for learning environments as "collaborative partners" (Knowles, 2005, p. 13), they will most likely find them more open and willing to learn because their andragogical principles are being met.

Cognitive Load Theory

Chandler (1998) describes how we must process through our "working memory" (p. 1) for something to be learned. Since our working memory has limitations for "both

capacity and duration (Simon, 1974)" (Chandler, 1998, p. 1), if the methods or other factors in the learning environment inhibit the working memory "from processing it, then learning and understanding will be hindered" (Chandler, 1998, p. 1).

What this means for the fire service is, if we allow learning environments that tax working memory by their nature, there is less available working memory for the students to fully process what we want them to learn. Again, autocratic learning environments have been proven to inhibit the learning ability of students. As Knowles (2005), et al, quote Goodwin Watson (1960), "An autocratic atmosphere also produces increasing dependence upon authority, with consequent obsequiousness, anxiety, shyness, and acquiescence. All these traits from autocratic atmospheres could potentially reduce the working memory of students.

Chandler (1998) breaks out two forms of cognitive load: 1) Intrinsic load – which is what he describes as "elements interacting", where "an element is any information to be learned that is held as a single item in working memory" (p. 30). The premise of intrinsic cognitive load deals with how many single items are being processes at the same time. The more elements that are being simultaneously processed in a more complex learning environment, the more potential for intrinsic cognitive load . 2) Extraneous load – "is generated by the intellectual complexity of the learning material, extraneous load is determined solely by how the instructions are formatted." (P. 3). What this means for us in the fire service is the realization that it does matter how we design our learning environments. Chandler (1998) gives an example of extraneous load from the effects of "inefficient instruction" (p. 3) resulting in higher extraneous cognitive load: "is when

teaching materials present mutually referring information separately (eg. A diagram and text) (p. 3).

The goal of choosing the Andragogical methods of adult learning, which support a collaborative learning progression, seek to achieve a lower overall cognitive load. By lowering the overall cognitive load the student potentially has more working memory to process the material being taught.

Chart 4.1 (Knowles 2005, 196) is adapted from "Pratt's (1998) model of high and low direction and support." The Collaborative Learner model shows the Collaborative Learner Progression, and the instructor – learner dependency ratio. The typical fire service career is portrayed above the line, where the repetitive cycle of new paradigms and new technology or procedures is portrayed below the line. The vertical lines indicate how much instructor/teacher direction is required. The horizontal line indicates how much dependency on the instructor/teacher the student exhibits.

An important concept to note, is that the progression may repeat itself over and over again as new knowledge is required. The most difficult position for an instructor, especially in the fire service, might be to have an advanced career person who is at high need for direction and dependency from the instructor. This situation, if recognized by the instructor as a pedagogical model, can be made more productive as the learner is prepped to accept the direction and dependency to learn enough new knowledge to where they require less direction and are less dependent on the instructor. Then the instructor/teacher can move into a facilitator role, lessening the learner dependency. The eventual goal for the instructor/teacher is to become collaborative learners with their students/learners.
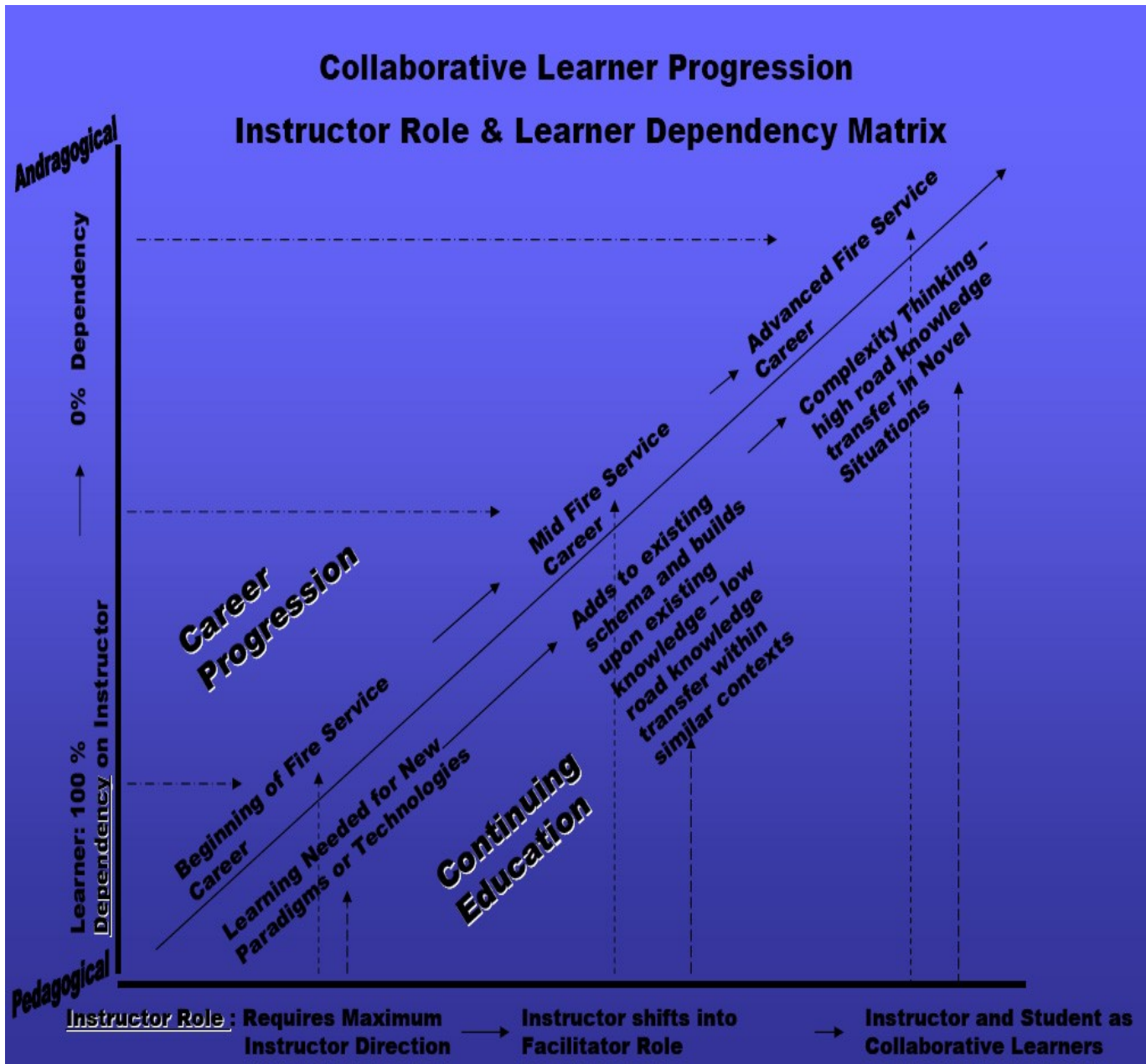
Chart 4.1

Chart 4.1 is adapted for the fire service from "Pratt's (1998) model of high and low direction and support" (Knowles 2005, p. 196).

Chapter 5

Complexity Science and Learning Culture

It is also important to understand that the components of a learning culture are affected by the forces described within Complexity Science, and are part of nonlinear dynamical and complex adaptive systems. Complexity Science is the study of Chaos and Complexity theories which yields the understanding of nonlinear dynamical systems, and complex adaptive systems. Nonlinear dynamical systems and complex adaptive systems are constantly affecting everything we do, and by understanding how they possibly affect the many learning culture components helps us to better prepare our learners.

Nonlinear dynamical systems are characterized by their variables being unpredictable. Sanders (1998) describes "variables can't be taken apart and added back together again like a child's building blocks; A+B does not equal C" (p.57). These component attributes exist not in a linear relationship, but in abstract ways. Since Chaos Theory is dependent on the initial conditions and possible consequences through Butterfly Effect; it's important to understand that Complexity theory, as described by Sanders (1998), "how order and structure arise through the process of adaptation set in motion by new information" (p.69). Complex Adaptive Systems, which are nonlinear and receiving new information and adapting with a new shape and emerge as a result of the adaptations. These adaptations are the product of the need for a new structure to form within a system.

Nonlinear and complex adaptive systems are especially applicable to the fire service learning culture. Examples of Complexity Thinking are prime for fire

departments: 1) The predictable attractor state is for the response equipment to arrive, Assess the situation and establish command, address rescue, evacuation, exposures, ventilation, fire attack, and support functions. (To a novice or untrained spectator the response process would appear chaotic, but there is order within the chaos.) If new information arises to create an incident within an incident, this is where an adaptation of the original system occurs. A higher priority may necessitate deviating manpower and equipment to another incident or system within this incident. This process is ever changing and dependent upon many forms of new or updated information. Most times these changes are a function of command, but as with ants and their leaving pheromones as an indicator of form emergence, there are "accepted command practices" that allow the fire scene system to adapt and emerge into another from.

The Learning Culture has many factors that are part of a complex adaptive system. These include but are not limited to: attunement with organizational hierarchy, performance assessment, mindfulness in learning, Self Efficacy, appropriate Pedagogical and Andragogical principles, Cognitive and Constructivist educational theories, environmentally sound web based platform for domain information, developing facilitation and facilitator guides, mindfully constructing learning environments--both virtual and physical, and evaluation.

These Learning Culture components contribute to the complex adaptive system, where as individual parts their sum may not form a whole. Each component must be regarded as it's own complex adaptive system, capable of change, adaptation, and emergence in an effective form. In a learning culture, there is no waiting for others to

provide the means to be educated, because the culture supports learning development,

learning involvement, and individual responsibility for learning at every level.

Chapter 6

Mindfulness

I have learned much from the study of "mindfulness" and how it is defined by Ellen J. Langer in The Power of Mindful Learning (1998). Langer says that "to have a mindful approach to any activity has three characteristics: the continuous creation of new categories; openness to new information; and an implicit awareness of more than one perspective." (p. 4) Langer explains that the opposite, "mindlessness" is "characterized by an entrapment in old categories; by automatic behavior that precludes attending to new signals; and by action that operates from a single perspective." (p. 4)

How this equates to us in the fire service is to develop and facilitate "mindful" learning environments. Langer (1998), describes how predictable it is to predestine how people will learn when given cues by their instructors about possibilities during instruction. She calls these "rigid mindsets" (Langer, 1998, p. 98) which can limit our abilities to see new paradigms for our learning.

I constantly encourage those firefighters whom I've had the privilege to facilitate learning with to envision the moment as new, and try to figure many ways for our subject (no matter what it is) to be used in our fire service job.

Langer's Mindful perspective focuses on the main goal for this guide; and that is to have whatever curriculums we develop, deliver, facilitate, evaluate, and update, to lead the learner to better problem solving skills. My hope is that each student who is taught from a more mindful perspective will have knowledge transfer in novel situations.

What do I mean by knowledge transfer in novel situations? An example would be for a fire company to consider how a seemingly simple tool might be utilized in a dozen

different ways while they learn. When they are called to perform in an actual emergency situation, there is a better possibility that their learning will transfer and be available to them during the emergency.   Langer (1998) has performed many studies that have indicated this is a predictable outcome of "mindful learning" (p. 18).

For any instruction that we develop, the mindful approach needs to be reinforced from the beginning. For those whom we provide written curriculums, presentations, or facilitated learning environments, either as facilitators to instruct others or as students themselves, we can help them be more mindful by clearly empowering them as having the power over their own learning.   This empowerment doesn't abdicate our responsibility as educators; it enhances it through collaboration with those doing the actual learning.

Chapter 7

Self Efficacy

Self efficacy is defined by Miltiadau (1999), when he quotes Bandura (1986): as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performance" (p. 391).

What this means to the fire service learning culture is that the more developed our individual self efficacy becomes, the better we can judge our ability to succeed in difficult subject domains. Miltiadau (1999) quotes Bandura 1993: when he writes that individuals with high self-efficacy "heighten and sustain their efforts in the face of failure" (p. 144). Self efficacy has been studied and is considered a strong indicator of individual success.

Mindfulness & Perceived Self Efficacy (PSE); Factors that are influenced by PSE :

Goal Setting for the Learning Culture

Performance Goals: According to Miltiadau (1999), if a person consistently sets "performance" based goals they are trying to evade negative consequences from educators or peers that their performance or education is inadequate. This attribute or choice of goal setting eventually leads to an inability to retain the information since the goal is to perform for others, not learn the new material to apply in novel situations.

Learning Goals: If a person believes through a strong PSE view of themselves that they can learn new and difficult subjects, and retain this for use in novel situations, then the setting of "learning goals" toward that end are much more effective. Since learning is the goal, the goal can only be achieved by the retention of the material, no

matter what other's think of the student. Learning goals are what the Learning Culture teachers/instructors/facilitators should encourage of themselves, and their students. It's through these learning goals, and assessing learning outcomes, that PSE is enhanced.

Commitment: PSE can influence our ability to commit to just about anything in life, especially education. If we have a weak or moderate view of our abilities, based upon past successes and failures, then we may only commit to low road type activities and educational opportunities.

If we work to improve, through "mindful" application, our PSE then we will progress to the utilization of our potential through higher road activities and educational opportunities.

Context of Choice

Depending upon the context of the choice, whether it be a job, a class, or recreation activity, a person will approach each with a predetermined PSE in place. This PSE will most likely be different for each different subject area.

An example, is my PSE as a Fire Captain for Poudre Fire Authority, which is developed for that context. While Instructing in Mexico, it is a different PSE that guides me, based upon that context. My abilities to perform multiple activities from many contexts during the same time period are from a separate PSE. PSE is an introspective method to assess our internal belief that we will succeed, based on our abilities to sustain effort during difficult environments.

Willingness to Risk

Assessing a person's ability to "risk" is based on their PSE.   The Learning Culture that supports collaborative learning may well be able to enhance individual PSE. I found no specific research available to clearly draw this conclusion, but much of Miltiadau's and Bandura's research supports this conclusion.

Education

For an individual to choose strong educational paths, utilizing difficult topics and practice, they would have to believe they could be competitive. If their life experience, education, peer feedback, educator feedback, parental instruction and feedback, and introspective feedback has been relatively positive then one could expect to find a high PSE as the foundation of their motivation.

Chapter 8

Organizational Hierarchy

"Forging Committed Partnerships" (Kelleher, 1997)

For the Learning Culture to be as effective as possible, we should seek to be in attunement with our organizational hierarchy. Borrowing from one of the more successful organizational models, Southwest Airlines, there are some basic organizational tenets that become clear, regarding employees training. If the management of an organization promotes learning as a cultural norm, "forging committed partnerships", as Herb Kelleher describes about Southwest Airlines (Kelleher, 1997), their employees are more productive and committed. Following this model, those responsible for fire service training should work to be in concert with all organizational levels, especially with those who have no direct control, but who may be directly impacted. They may expect less organizational friction, which can greatly hinder the development of a Learning Culture.

In fire service training organizations, the organizational hierarchy will most likely mimic the para-militaristic hierarchy, which will be staffed by lieutenants, captains, and or chiefs. In large fire service organizations the staff dedicated for training may be adequate, but in most small to medium sized departments they may be fortunate to have only a minimal staffing to plan, develop, deliver, and evaluate needed training programs.

Understanding and working to build trust between the organizational hierarchy and training personnel is essential for those who wish to promote the Learning Culture. It is by establishing relationships between instructors/facilitators and those who will be affected by their educational deliveries that will reap the synergy that a Learning Culture can produce.

For example, I left my on-line fire company in December, 2005, to take one of two training captain positions for Poudre Fire Authority (PFA). I immediately interviewed all three shift battalion chiefs (BC's) to introduce myself as their training captain. They had known me as a fire company captain, which was a much different dynamic than what I was promoting as their training captain. What I learned from them was their need to not have me dictate my, or the Training Division's, agenda onto them. Basically, in 2006, all planning and events were routed through these battalion chiefs prior to any fire companies receiving the plan. This way the BC's could make changes or suggestions to us prior to having to adjust 36 fire company schedules. This relationship has proven itself during the many PFA training division offerings in 2006. I believe this relationship will become more significant in 2007 as plan, develop, deliver, and evaluate many training programs (See Appendix A).

For the learning culture, the trust and collaboration established helps lessen organizational friction, especially if all involved operate in as transparent of process as possible.

Chapter 9

Constructivism and Constructive Learning Environments

While developing the Andragogical Learning Culture Concept for the fire service, I chose the use of constructive learning environments, and constructivism as a basis for understanding how we learn.

Jonassen (1999) conveys the following about Objectivist vs. Constructivist learning designs. The Objectivist notion that knowledge can be transmitted by a teacher and received by a student, is in contrast to constructivist which says "knowledge cannot be transmitted, but must be "constructed" from experiences (p. 217).

For the fire service Learning Culture model, the constructive learning environment (CLE) is designed to address problem solving, and Jonassen (1999) states: "The fundamental difference between CLEs and objectivist instruction is that the problem drives the learning, rather than acting as an example of the concepts and principles previously taught" (p. .   What this means is when we design a learning environment, whether it be on-line via the web site, or in the field as a practical exercise, the main focus will be to solve some relative problem. By using CLEs this way the individuals may construct their own learning, as individuals and in social settings.

The key elements to CLEs are, according to Jonassen (1999), 1) A problem context that the learner can feel they are a part of, or have "ownership" in (p. 220); 2) A "performance environment" as well as context that allows the learners to understand the problem better; 3) "Community of Practitioners/Performers/Stakeholders" (p. 220) which let's the learner know who the players are for their problem to solve; 4) "Problem representation/Simulation" (p. 221) which presents the representation of the problem to

the learners, and the quality of this is "critical to learner buy-in" (p. 221) According to Jonassen, this representation "must perturb the learner"; 5) The problem must be "authentic" which means "supporting the performance of specific real-world tasks" (p. 221); 6) The "Problem Manipulation Space" (p. 222) is where the learners are involved in "mindful activity" (p. 222) where "they must manipulate something (construct a product, manipulate parameters, make decisions) and affect the environment in some way" (p. 222).   These are the key elements to Jonassen's CLEs, which I've adapted to use in the Learning Culture model. The CLEs are to be supported by solid domain information which allows for the learner to have the tools to understand and construct their own solutions to the problem.

In 2006 I utilized this CLE concept for Poudre Fire Authority (PFA) driver operator annual skills training. I'll use one example to describe the use of CLE's in the fire service culture. In August of 2006, the PFA driver operator skills CLE problem was accomplishing 2000 gallons per minute -- with two fire engines to PFA's Truck 1. All crews felt ownership in solving the problem, since none had ever previously flowed this volume of water in training. The performance environment was a known hydranted water system at our training facility, but unknown water system dynamics.   The performers or stakeholders are the crews who are assigned to perform this exercise under actual fire scene conditions. The simulation was as would be accomplished, without the critical time elements and resource constraints of an actual fire scene.   The mindful activity was presented (see Chart 4.1) by the instructors, then the fire crews on scene were allowed to problem solve and attempt to accomplish successful results.   The progression for this paradigm of water flow began with instructor dependency by the

students to explain the scope and purpose, as well as pertinent safety information. The instructors assigned Fire Captains to assume key roles, and then the instructors passed into a facilitator role.   As the simulation was developing, all involved were collaborative learners. Each simulation (3 days, and 5 classes each day) were different depending upon the methods chosen by the crews. I captured the relevant lessons learned and produced a presentation which was posted on the web site, as additional domain information (See Appendix G).

The most significant aspect of CLEs for us in the fire service, is the ability to maintain the complexity while training.   What I mean by this is that many times instruction design "often filters out the complexity that exists in most applied knowledge domains" (Jonassen, 1998, p. 224). What this means for the fire service is that many times instruction tries to level the educational playing field to bring information to all cognitive levels at once. "Cognitive Flexibility", as Jonassen (1998) describes is when the complexity is allowed to remain in instruction, thus allowing all levels of cognitive development to construct their own knowledge from their specific levels. Jonassen et al, have described Cognitive Flexibly Hypertext as a means to take case based information which "provides multiple representations fo the content in order to convey the complexity that is inherent in the knowledge domain" (p. 224).

Virtual & Physical CLEs

Much of the published information about CLEs are designed for the virtual environment, as Jonassen (1999) indicates. The virtual environment is dependent on a

sound Internet or Intranet access, as well as the ability to construct web pages that are easily accessed. Chapter 10 will cover the Web in more detail.

For 2007 we are developing virtual CLE's prior to their field CLE's, so they may solve for what they think may happen, then actually try their hypothesis out in the physical environment. The web based presentation of the problem, the context, and manipulation space, allow for perturbation and problem solving in the station. The physical CLE, or realistic simulation, reconciles the hypothetical with the actual problem solving results.

Facilitation

In 2006 I hired many associate instructors to assist me with facilitating these CLEs. I attempted to share our Learning Culture facilitator philosophy with the other instructors. Without data to support the results, I conveyed this as our role and just oversaw the other instructors. All were into the spirit of facilitation, instead of "teaching" and directing the fire crews.

In 2007, I will hold an instructor meeting, prior to any learning environments, to present the Learning Culture, and their role as facilitators. Hopefully, they will be aware of the changes, and be willing to participate as teachers when needed, facilitators when needed, and collaborative learners when appropriate.

Facilitator Guides

I chose the use of facilitator guides to impart the problem and context, through learning goals, outcomes, and objectives. These facilitator guides were designed in 2006,

for PFA's Driver Operator skills training program. The intent was to have our training staff facilitate the CLEs, but recognizing the reality that many learners would miss the scheduled CLE, it was imperative that the company captain be able to facilitate these CLEs for their crews.

I fielded approximately 3 phone calls from company captains who had questions about the facilitator's guides (36 fire companies, 150 firefighters in PFA). When the question was asked about make up training, I asked them if they had any problems finding the PFA Training Division, driver operator skills web page? They all said they had no problems finding the web site. I asked them to please read the facilitator's guide, and call me if they didn't feel they could accomplish the learning outcomes, via the learning goals and objectives. I had no captains call and ask me for help. All PFA drivers accomplished their required skills training, with the exception of one, who chose to not participate for personal reasons (see Appendix G)

In 2007, we will rely on facilitator guides to present the CLE problem, context, manipulation space parameters, simulation required equipment, personnel, or logistics. (see Appendix G).

Chapter 10

Performance Assessment

No guide to learning culture development would be complete without a chapter on assessing the performance of current training programs. In her book, First Things Fast, Allison Rossett explains in detail how easy and quick a performance analysis is for an organization. The key to understanding whether a fire department learning environment needs to change is to ask some very simple questions of those most affected. Basically, what is the current condition and what should the optimal condition be; what are the key areas of need, and what recommendations for a solution system are available. According to Rossett (1998), "performance analysis involves reaching out for several perspectives on a problem or opportunity, determining any and all drivers toward or barriers to successful performance, and proposing a solution system based on what is learned, not on what is typically done" (p. 13).

An example of one performance assessment I made in 2005, regarding how the PFA training division scheduled company training, is as follows: The current fire company training scheduling didn't directly take into account the needs of the battalion chiefs not having their monthly schedules changed by the training division. Informally, we tried not to adversely affect their schedules, but often times the possibility existed for the training division to unintentionally cause scheduling conflicts. The training officers would schedule multiple company training, or other events and publish this to the Intranet via email. Once it was published all affected could read what was dictated, and the officers and battalion chiefs had to work to adjust for conflicts that the training officers

missed. The training officers had no idea what had been already scheduled at the company or shift levels.

The optimal condition would allow the PFA training officers to develop training classes or events, and publish only to the battalion chiefs for their preliminary review and approval. Only after this approval could the monthly schedule for training events be published to all of PFA. This optimal condition data was obtained through direct interview with the three affected battalion chiefs, as qualitative data. (see Appendix A)

The recommended solution system, initially, called for the training officers to publish proposed future training events to the battalion chiefs for their approval, sometimes many months in advance. This allowed for a very smooth scheduling process and problem solving collaboration. One added benefit of this performance analysis and solution system change was the added appreciation and cooperation towards the PFA training division staff for our consideration of their schedules and needs.

Clearly, this performance analysis didn't require a training needs assessment, since it only dealt with information dissemination. Other areas have dealt with much more complex subjects, which do require a full training needs assessment.

Fire service Learning-Cultures must be performance analysis driven, since this performance is the true test of whether students have taken ownership of and accountability for their own learning. If the current situations don't line up with the optimal, then assessments and adjustments may be needed. Without this performance analysis tool as a guiding Learning-Culture principle, the training programs themselves could become the targets for change. Likely, any adjustments needed should target the

instructors/facilitators and how they present the Learning Culture student/learner roles to their students.

Chapter 11

Web and Internet

A vital resource to support your learning culture is the Internet, specifically the use of hyper linking files and web pages to support information dissemination and learning tools. At the very least each computer at your organization must be on the same operating system, and be powerful enough to support multitasking between software programs. These connections should be able to access the Internet at more than dial-up speed. Expensive networking lines are not required to make this technology work in a learning culture, but modern computer equipment and software are necessary.

An example: We were attempting to centralize our scheduling calendar for training activities at PFA in 2006. We didn't perform a performance analysis of the computer environment prior to making an Intranet based Microsoft Share Point calendar available to fire department personnel.

One afternoon I was meeting with a fire crew to assess their level of ability with this new calendar program, and they told me it wouldn't work for them. I tried to log on and use the calendar from their station, and I couldn't make it work either. This was simply an information technology problem that was rendering our learning culture useless to our target users. From this event our PFA IT staff developed a "roving log-on" and computer upgrade purchase to ensure all personnel had the same platform for access to the PFA Intranet.

If you are fortunate enough to have an IT department, and your own servers to build your web pages on, you are an advanced user. You will be able to develop the

component of strong Web and Internet resources that will make your domain information and learning materials available to your personnel.

If you are wondering how to go about getting a web site setup there are many options for you. For very low cost there are literally dozens, if not hundreds, of providers that set up initial website design for you. Being able to design web sites is not the focus of why you need strong web and internet in a learning culture. The ability to create and manipulate additional WebPages that are tailored for your needs is what you will need, and this is not as difficult as it sounds. There are numerous ways to develop training web pages that support solid domain information, and I've chosen Microsoft Power Point (PPT) as my HTML creation tool. You may find another program, like Dream Weaver or Front Page are HTML editors of your preference.

By using PPT, I layout my web page design just like with any other web development program. The goal is to have accessible solid domain information in one place, where all personnel can find the most current and accurate information regarding their scheduled training classes and events. Your web site is where you can manage your CLEs and provide the domain information, as well as the facilitator guides. Without some kind of web access for your firefighters, you will need to utilize hard-copy and more conventional multimedia offerings.

Chapter 12

Reflections and Validation

As I've assembled this guide to fostering a fire service Learning Culture, I'm more committed than ever to seeing these concepts published, in this context. As I describe the concepts (captured in Chart 4.1) to other's in the fire service, I get the same comment: "that is exactly what we need; you need to get that out to the troops".

What Chart 4.1 shows, it the relationship between how much direction and dependency a learner will need and exhibit at different times in their learning life. I relate this to the fire service, but it can be adapted for other uses. The concepts are a culmination of all my readings during this JIU experience. The key for me was while reading Knowles (2005), The Adult Learner, and seeing how Pratt (1988) described high direction and dependency. I took this as insight how to explain how and why the Andragogical model works so well for fire service training and development. More importantly is the reactions I've observed from other instructors when I've described the teacher/student relationship to them. Once they see it, they understand what has been missing. What is usually missing for many fire service instructors is the understanding that high instructor direction should be as temporary as possible, yielding to a facilitation role, and depending upon the learners and subjects – collaborative learner roles. These fire service instructors's must be taught to prep their learners to better understand the Collaborative Learner Progression (Chart 4.1). This progression allows for initial high direction from the instructor and high dependency by the student, but this is a temporary condition. As the student gains enough new knowledge to perform independently of the instructor, the student needs to have time to manipulate and validate

this new knowledge. As facilitator's the instructor plays a much different role that validates the Andragogical methods. As the learner gains knowledge they should be encouraged to develop their understanding by physically applying their new knowledge and updating their understanding. This progression begins with new (adult) fire recruits and develops over many months in an initial fire academy experience. Then the same progression will take place as they develop within their career. They may return to a need for high direction and dependency, as pedagogical learners, but the amount of time where they remain in this state will depend upon the learner and their previous knowledge and understanding. As the learner progresses into "mid fire service career" they expect to have their learning facilitated, not directed (see Chart 4.1).

As of the beginning of 2006, these concepts seemed valid, but needed to be tested. Fortunately, I had the opportunity to develop the Learning Culture, Andragogical principles, with Poudre Fire Authority (PFA). By using a third party survey tool, Surveymonkey.com, I've been able to collect data from 150 firefighters, during 13 surveys, covering 258 CLEs (see Appendix C). This data has given us solid data about how effective we've been at facilitating their Constructive Learning Environments (CLEs).

One tangible way the Learning Culture was observed in 2006, was when crews were able to accomplish the learning outcomes by using the web support for domain information, facilitator's guides for lesson plans and consistency, and by constructing their own learning environments. This occurred when a small number of D/O's were not able to attend the scheduled CLE's that we provided as a Training Division. I received no communication past an initial phone call indicating the model was not working. The

litmus test was when I received 82 completed D/O Skills packets on November 15, 2006

(Unavailable)

In 2007, I've developed a series of web pages that supports nine months of driver operator (D/O) skills. These web pages include the basic components of the fire service Learning Culture – solid domain information, facilitator's guides, and constructive learning environments. Each web page will have surveys developed to collect data from the learning environment offerings. This data will give us direct information about the effectiveness of our learning environment designs.

PFA is fortunate to have one acquired house for use during 2007 and possibly six others during the next two years. These training resources, combined with the driver skills training, will give us (PFA's training division) an opportunity to improve on our 2006 Learning Culture.

Interviews

I've interviewed five officers who were directly affected by the 2006 Learning Culture. I received valid feedback, and overwhelmingly the feedback was positive. I was encouraged to continue with how we are currently offering training. In February, 2007, I surveyed the entire PFA population to ask their assessment of the effectiveness of the PFA Learning Culture (Unavailable). The data received represented 10% of recipients, and validated the moves toward a Learning Culture in 2006.

During 2006, I received numerous questions that required clarification, but no dissention or real problems with any firefighter's not being able to learn from the domain information, facilitator's guides, or CLEs. This seemed unusual, if there were problems

with our instructional design, since we had so much contact with them during the 258

CLEs. Our conclusion was that the Learning Culture resources that I designed, and

PFA's Training Division put in place were being effective, and well received.

If the Learning Culture wasn't effective, we would have observed inconsistencies

of performance, as well as much more feedback.

Surveys

The use of a third party, anonymous, survey tool has proven to be an asset for our

data collection. Consistently, I've received about a 10 – 20% response to our 13 surveys.

As the PFA firefighters have been exposed to the survey tool, I'm seeing a higher

response than one year ago.

Conclusions

With a solid beginning to developing a learning culture at PFA, our challenge is

to provide learning for the Captain's who will be the primary

instructor/facilitator/collaborative learner for their crews.   If we are successful in

conveying the components of the Learning Culture, as I've described in this guide, and

supporting the Captain's with well developed learning design and CLE's, the PFA

Learning Culture will continue to grow.

My next challenge is to expose as many fire service instructor's as possible to the

concepts of the Learning Culture. I hope to present this material at the December 2007,

Fire Leadership Conference, in Breckenridge, Colorado.

Bill Salmon's
Ten Moral Maxims

1.   *Tell the truth always, or don't say anything at all.*

2.   *Know why I believe what I believe, then follow my beliefs*

3.   *Walk my talk, renegotiate agreements when I can't*

4.   *Appreciate those different from me, foster an attitude of learning from everyone*

5.   *Some things are worth risking my life for*

6.   *Don't be afraid of calculated risks, they warm the spirit*

7.   *I am what I am when I'm alone, and looking in the mirror is the best test of who and what I am*

8.   *Value the preciousness of life, and awe at the intricacies of our bodies*

9.   *Be a model for young people to emulate*

10.   *Leave the world a better place for having lived, be remembered for something good*

4.   *Be kind, and listen*

Appendix A

Actual January, 2006 Battalion Chief Interview Questions

Shift Training

My view of shift training takes two tracks. One, if it's a case of better information to the troops I'd like to continue to develop the Intranet and VTC for these deliveries. Two, if it's a case of instruction I want to enhance the role of the Captain to be more capable of being the first line training officer. By enhance, I mean to provide those lacking instructor knowledge and certification a means to receive this training while on shift. These trained Captains then need well developed course material that they deliver to their crews. There are many ways to assist in this delivery. Some ideas may include weekly VTC broadcasts to stimulate company training early in a month or quarter. Follow-up is the key, and the training captain can provide this follow-up to ensure standardized instruction. In my estimation, PFA has been lacking in standardized training that is decentralized, while focusing on the centralized training from the training

Basic Skills

1) What has worked and what hasn't?

2) If Basic Skills were tied into certification, CPT or OD related documents, what would you like to see from Training to help facilitate these basic skills?

3) How involved in the delivery and critique of company skills do you want Training staff to be?

Company Officer Role

1) Do you see the primary instructors being the Company officers?

2) What help would you like to see for your officers, i.e., curriculum development, lesson plans, props, etc.?

Specialized training

1) In addition to formal PFA training, what help would you like with specialized training? For example, do you want night evolutions in the rural theater? Would you want a quarterly - shift specific - training event? Being creative, as a shift, what do you see that I can do to help you facilitate realistic training scenarios to your shift?

2) How do you want seasonal subjects brought to your shift? For example, ice rescue, wildland, chimney fires, etc.

3) Do you foresee needing training division help with updates and training for technical subjects like vehicle safety systems, thermal imager use, or other technology?

CPT's

1) What have you liked about the current 2000 - 2005 CPT's?

2) What would you like to see added or changed in the CPT program?

3) Considering evaluation of performance, how would you like the training staff to address superior or deficient performance on the drill ground?

Acquired Buildings

1) If an acquired building is obtained, do you wish to have your shift participate as often as is possible, or will it depend on the current circumstances?

2) What kinds of acquired buildings do you wish to see obtained, and is it worth spending money to lease space to provide realistic training scenarios?

Minimum Staffing

      1) I am willing to provide coverage for your shift when either the situation or system dictates this need.

After Action Reviews

      1) In the recent past the training staff assisted with AAR productions. I believe there is no single better source for learning for our companies. We need to continue to produce AAR's for the shifts, and assist in guiding the organization towards better guidelines for AAR's. The involved BC or Captain should be able to send a message on an Intranet form and know it will be produced and facilitated. This producing of AAR's in no way takes away from the officer's or BC's responsibility to conduct the AAR. By facilitate I see it as an administrative function that keeps the AAR moving, and accounts for the posting of the AAR when complete. Training should track and publish lessons learned from AAR's, to ensure all of PFA learn from actual incidents. In my humble opinion, this AAR project does need much attention.

2) What help would you like in producing AAR's for your shift?

3) What has worked or not worked for you in the past, regarding training's assistance with AAR's?

4) Would you support a Training Captain being authorized to receive the tapes at dispatch, and retrieve all pertinent media for the AAR?

My Charter

I see my position at training as a resource for 36 companies at PFA, support staff, volunteers, as well as our consortium partners. This view means the typical check-in at 8am and leave by 5pm simply won't work. I can see getting much administrative work done in my office or at home after hours, and devoting much hands-on time to primarily support fire companies during the typical business hours. As you know, I now have a blackberry which means I'm truly available on a 24 hours basis. I currently answer emails and phone calls at all times, so I anticipate my availability as an asset in managing a busy and complex schedule. Many times our folks don't need us physically there; they need to know about an issue, training prop, building, etc. I can willingly provide this kind of service.

I would like to focus on the administrative TO duties by being as pre- planned as possible. This planning would involve training staff meetings, meetings with shift personnel, the BC's, and others to get a scope and feel for what needs to be done. Then I would provide draft plans for each area with responsible personnel agreeing to support the plan. I would then hold myself and those in positions of responsibility to follow through. This kind of planning would be ongoing and need constant updating, but I believe it's the key to accountability and accomplishment. This kind of planning philosophy also leaves a trail of how we got to where we are, and it makes transitioning between personnel much easier and more consistent for our customers. I can see this being a benefit when this training captain moves into Andy Vigil's position in 2006

On Call BC/ Acting BC

1) Would you like to have me spend time with you to get your input regarding on call BC?

2) Can we schedule a time to meet?

VTC

1) How best would you like to see VTC used for your shift?

2) What is your minimum level of efficacy for the system?

3) Do you want your instructors trained in how to teach through VTC?

A-Shift Ride: December 29, 14:00 sta 1

B-Shift Ride: Dec 28, 13:00

C-Shift Ride: Dec 30, 08:00

Training Division Future Vision

1) Where do you see the training division's role in helping PFA to grow as a department?

"Training Culture to Learning Culture"
Capstone Project Blueprint

EDU669
Module 1.1
Bill Salmon

Rationale for the project

In 2006, As the Poudre Fire Authority (PFA) training captain responsible for planning and developing new and continued fire service training to 36 fire companies (basic work unit of the fire service - 3 to 5 people on a company), I quickly identified the need of a change of   the existing educational model (Pedagogical model) to a Andragogical-Constructivist learning culture in order to meet the growing demands of the increased requirements and numbers in the population.. In 2006, using Andragogical and Constructivist models, I developed a series of 7 web pages in support of 18 educational subject domain offerings via the PFA Intranet, followed-up by 258 field constructive learning environments (CLE) with great success and positive feedback..

The previous educational model was one that developed and delivered one class at a time. The training division or an instructor ,with subject matter expertise, developed a class in the form of an outline and Power Point and/or limited, non interactive multimedia.   These courses were delivered 12 times over 3 days to 36 separate fire companies. This necessitated the movement of 36 companies, and the focus was on the instructor (Objectivist Model) to deliver class and utilize practical materials at each class. Due to the time and resource limitations of this model, only a very few classes were developed each year for delivery. There was no requirement for any lesson plans which detailed learning goals, outcomes, and objectives. Consistency and reproducibility were not assured.

Inherent in the 7 web pages that I developed in 2006 a facilitator's guide was included.   This guide entailed a detailed lesson plan, which included learning goals, outcomes, specific objectives to accomplish the goals and learning outcomes, as well as

necessary resources required to produce the class. The CLE's that followed these web pages were a mirror image of the web facilitator's guide.   The primary reason for developing the facilitator's guide as part of the website offerings was to guide the fire company captains into the role of the primary instructor's for their own crews. For each domain that was addressed, the battalion chiefs and captains were advised that they were not required to attend the training division facilitated CLE's and that they would be able to construct their own learning utilizing the online facilitator's guides. For the few who are on vacation, sick, or on emergency responses during the times when these CLE's were delivered by the training division, it was imperative the company captain would be able to provide the make-up training for their firefighters who missed the scheduled classes. Resource and logistics became the driving force for the implementation of this program.

Statement of purpose

My Capstone Project purpose is to create a document which can be primarily utilized by fire service personnel that details how to move from a training culture where the focus is on the trainer, to a learning culture where the focus is on the learner; where the academic principles of Andragogical educational theories as adult learners are followed. I propose to substantiate the assumption that fire service training although initially a pedagogical model, can become an Andragogical model as firefighters develop past recruit status. There are components of this project document that fits both models but shows the advantages of moving the culture toward the Andragogical.

In the fire service, the primary provider of instruction, the company officer, is not an educational professional. There is a significant need for academically proven subject domain information that is available to help these officers on the front line that are placed

in the position of educators.   Use of Web and hyperlink technologies to build subject domain information web pages, to include facilitator's guides that lead the officers through instructing their crew members and followed up by constructive learning environments, are the basis of my Training Culture to Learning Culture (LC) project.

Educational and practical relevance

As a fire service educator, I have observed through many planning sessions and course deliveries, how difficult the planning and implementation of training is for most fire organizations. Every organization has dynamics specific to their discipline and the fire service has the critical need to gain new knowledge in literally dozens, if not hundreds, of subject domain arenas over a short period of time. As I pursued my M. Ed. Curriculum, an apparent pattern began to develop in my mind that focused on the Androgogical theories espoused by Alexander Kapp and Malcolm Knowles. (http://en.wikipedia.org/wiki/Andragogy). Specifically, my belief is that most fire service educators don't consciously understand the realistic and dynamic difference between a Pedagogical or Andragogical model and yet the power and responsibility for instruction and learning is placed in the Captain's hands. I've focused also on the predominant educational theories and I've chosen the Constructivist theory of education as my main delivery model, in direct support of these Andragogical concepts.

Target population and learning community

My target audience for this "Training Culture to Learning Culture" project are the officer's who supervise and educate fire service personnel A change in culture is essential to empower the company captain by supporting the development and implementation of changes in the learning culture.

The PFA serves a population of approximately 150,000 people, and covers a geographical size of 235 square miles.   The PFA is comprised of twelve career fire companies, operating from three 24 hour shift schedules, for a total of 36 fire companies. The minimum manning for the PFA is 126 online firefighters, with the number usually being approximately 140 — 150 active personnel. There are only 10 support personnel spread between fire prevention, training, and the office of emergency management to meet the needs of the entire organization.

Statement of the benefit and evaluation criteria

My Capstone project will clearly establish the academic soundness, through documentation of published references and the practical examination of the validity of a learning culture vs. a training culture, and detail how to recognize the symptoms of both. Most critically, it will also examine how to choose which model to is the most effective for a given situation.

The evaluation criteria:

- Upon completion the Learning Culture instructional guide is readable as a guide or booklet, complete with hypertext linked index.

- The document has clear documentation to substantiate all assertions made

- The document has clear examples of problems that detail the structure and complexity of the learning culture model.

- The document has clear examples of learning culture website actual use and successes and failures, including developed survey data from actual firefighter input.

- The document has validated data from interviews and surveys from the target audiences of this project.

- The document has clear examples of facilitator guide formats

- A PFA Domain website in support of this project is constructed in support of CLE's

Detailed project work plan and timeline

- Provide weekly progress reports to Dr. Schwabe using the JIU progress report form, to be submitted on January 20, 27, February 3, 10, 17, 24, and March 3, 2007.

- Develop the first draft of the Learning Culture Instructional Guide by February 3, 2007.

- Develop the facilitator's guides, lesson plans, and web pages for the PFA website by February 15, 2007.

- Develop the Module 3 Learning Report by February 25, 2007

- Develop the Module 4 Capstone Project Presentation by March 4, 2007

I propose to produce, in addition to a Learning Culture instructional guide, two website's in support of nine CLE's:

In 2007, PFA has access to an acquired structure from January — December, 2007.   This is a 1200 sq. ft. residential house. This house will be used in 2007 to deliver four separate fire service subject domains: positive pressure fire attack, positive pressure ventilation, SCBA emergency breathing (EBSS), and hose management. The website I

will create is in direct support of this acquired house, and will include facilitator's guides for each subject domain, published multimedia in support of the subject domains, assessment tools, and survey links to give and receive feedback.

The second website I will create is to support the continuing education of PFA's currently certified driver operators. This website will include five NFPA 1002 subject domain topics, which will be presented through facilitator's guides, multimedia support, assessment tools, and survey links to give and receive feedback.

These web sites will be the live domain information that will support the company officers and training staff that facilitate learning through these Learning Culture CLE's.

Materials and resources required

For the Learning Culture instructional guide I will utilize much research from all the M. Ed. JIU courses and references. I will conduct new research in a quest to ensure I account for new data, studies, or publications relating to my learning culture topic.

For the PFA website in support of the PFA fire company CLE's, I will need my computer, access to the PFA Intranet server, Front Page web development software, Power Point software, PDF writer software, and time.

Presentation outline for final review

I will create a Webpage on the JIU server that will present my project using the below methods:

- Learning Culture instructional guide will be presented using PDF and hypertext links to web pages or resources.

- The PFA web pages will be uploaded to JIU server for demonstration, since the actual website will be on the PFA Intranet, behind the PFA firewall.

References

Andragogical Theory, http://en.wikipedia.org/wiki/Andragogy, downloaded January 13, 2007

Appendix C

Poudre Fire Authority, 2006 -- Physical Constructive Learning Environments (CLE) &
Web page support of domain information.

2006 PFA Offerings Created	CLE Total classes Facilitated =	Intranet webpage Domain Support	Subject domains via web per CLE
February House	60	1	2
First FRFC D/O Academy			
June D/O	60	1	2
July D/O	60	1	2
August D/O	15	1	1
September D/O	3	1	2
October House	18	1	5
November House	42	1	4
Total =	258	7	18
PFA Firefighter data	126	Firefighters on shift	36 Fire Companies

Appendix D - Definitions for Understanding

Portfolio: Galbraith, 2004, p. 328, says in context of portfolio as a benefit for adult learners: "...that much of the knowledge we use is not specialized but serendipitous, suggests that a focus on self-assessment can have a broad and powerful effect on both learning and subsequent practice. In particular if we conceive of epistemology as a *constructivist process* that recognizes individuals as the architects of their own knowledge, as opposed to one that renders them passive objects waiting to be shaped by more knowledgeable le faculty, the potential of the portfolio to radically reform both teaching and learning has great promise."

Adult learning strategies: (Galbraith, 2004, p. 184) " Learning strategies in the field of adult education include the five conceptual areas of metacognition, metamotivation, memory, critical thinking, and resource management (Fellenz & Conti, 1993)"

Mindful Learning -- "A mindful approach to any activity has three characteristics: the continuous creation of new categories; openness to new information; and an implicit awareness of more than one perspective." (E. Langer, The Powr of Mindful Learning, 1997, p. 4)

Definitions
Attractor – An attractor is the end state or final behavior toward which a nonlinear dynamical system moves" (Sanders, 1998, p. 66).

1) Pedantically – Too concerned with formal rules and details (Encarta Dictionary)

2) Novel Situations – New, original, and different, and often particularly interesting or unusual as well. (Encarta Dictionary)

3) Cognition – The mental faculty or process of acquiring knowledge by the use of reasoning, intuition, or perception. (Encarta Dictionary)

4) Learning – 1) The acquisition of knowledge or skill (Encarta Dictionary).

5) Instruction – Teaching in a particular subject or skill, or the facts or skills taught (Encarta Dictionary).

6) Meaningful learning:
Sideway Learning - " aims at maintaining a mindful state... the concept of mindfulness revolves around certain psychological states that are really different versions of the same thing: 1) openness to novelty; 2) alertness to distinction; 3) sensitivity to different contexts; 4) implicit, if not explicit, awareness of multiple perspectives; and 5) orientation in the present... In such a state of mind, basic skills and information guide our behavior in the present, rather than run it like a computer program." (Langer, p. 23)

7) Einstellung effect: "The Einstellung effect "creates a mechanized state of mind, a blind attitude toward problems; one does not look at the problem on its own merits but is led by a mechanical application of a used method." (Gestalt, p. 56)"

8) Bloom, 1979, six levels of cognitive processing: (Galbraith, 2004, p. 188)
"Knowledge -- recalling facts
Comprehension -- restating knowledge
Application -- Applying or using information in a new situation
Analysis -- examining the parts and the relationship between the parts
Synthesis -- putting together information in a unique or novel way to solve a problem
Evaluation -- making judgment based on given criteria

09) Metacognition -- as Galbraith, p. 184 states -- "is popularly conceived as the thinking about the process of learning and emphasizes self regulatory tactics used to ensure success in the learning endeavor."

10) Metamotivation -- as Galbraith, p. 184 states -- " deals with how individuals build and maintain internal motivation to complete learning tasks."

11) Memory -- as Galbraith, p. 184 states -- is concerned with storage, retention, and retrieval of knowledge."

12) Critical thinking -- as Galbraith, p. 184 states -- "involves how one discriminates and reflects upon learning material."

13) Resource Management -- as Galbraith, p. 184 states -- "relates to how learners identify and critically use appropriate sources of information for the learning task."

14) Navigators Learning Strategy Preference -- as Galbraith, p. 185 states -- " are focused learners and chart a course for learning and follow it."
Nonlinear dynamical systems

15) Problem Solver Learning Strategy Preference -- as Galbraith, p. 185 -- "rely on critical thinking skills. This is a reflective thinking process which uses higher order thinking skills (Brookfield, 1987)."

16) Engager Learning Strategy Preference -- as Galbraith, p. 185 -- "Engagers are passionate learners who love to learn, learn with feeling, and learn best when they are actively engaged in a meaningful manner with the learning task; "the key to learning is engagement--a relationship between the learner, the task or subject matter, the environment, and the teacher" (Kidd, 1973, p. 266)

17) Conditional language: "one way to..." (Langer, p. 22)

18) Absolute language: "the way to..." (Langer, p. 22)

19) Active learners "who seek to understand complex subject matter and are better prepared to transfer what they have learned to new problems and settings (How People Learn, Expanded Edition, www.nap.edu/openbook/0309070368/html/12.html, p. 12)

Complexity Science

Complexity Science
William A. Salmon
Jones International University

Bill Salmon
EDU734
Module 1.1

Complexity Science

History of Decision Making Systems

In her book, Strategic Thinking and the New Science, 1998, T. Irene Sanders provides a world view of how and why mechanistic or linear thinking became the norm. The development of society over the past 2000 + years gave root to the belief that to understand the parts meant we could understand the whole. "The interweaving of scientific and religious views created a world of cause-effect thinking, belief systems, and institutions that were fixed and inflexible" (Sanders 1998, p.50). This way of thinking describes linear thinking and problem solving as we've all known it.

Chaos Theory

The advance of technology has helped perform the mathematics necessary to show the study of Chaos Theory, where through mathematics and a view of the bigger picture, the hidden order within what appears to be disorder can be shown. Chaos theory's hidden order was first shown by Lorenz's study of weather, and his experiment with convection that revealed the "Lorenz Attractor" (Sanders, 1998, p.59). Lorenz theorized that there were variables happening within systems that appeared to be in chaos or completely without predictable order, and this lead him to discover "attractors." "An attractor is the end state or final behavior toward which a nonlinear dynamical system moves" (Sanders, 1998, p.66). These end states are either predictable or unpredictable; this predictability is for the end attractor state only and not to predict what happens to get to the end state. This is essence of a nonlinear dynamical system, and how even though it may seem predictable by knowing it's attractor state, input into the

nonlinear dynamical system my alter the attractor, or end state.   According to Sanders (1998) "there are chaotic systems that never settle into a predictable or steady state, and those are said to have strange attractors" (p. 66). The term strange attractor "describes the behavior of the force or forces that hold the system variables in place." (Sanders, 1998, p.67) These strange attractors also establish the boundaries of the system; an example used is a hurricane or tornado.

   The Butterfly Effect is used to describe, within Chaos Theory: "the image of a butterfly flapping its wings in Asia and causing a hurricane in the Atlantic" (Sanders, 1998, p.57). The implications for disaster or unintended consequences are great, and Sanders describes the following description of the butterfly effect:

> "how small systems interact with large systems. A small change in the initial conditions of one system multiply upward, expanding into larger and larger systems, changing conditions all along the way, eventually causing unexpected consequences at a broader level sometime in the future" (Sanders, 1998, p.57).

Complexity Science

   Complexity Science is the study of Chaos and Complexity theories, through the understanding of nonlinear dynamical systems, and complex adaptive systems.   Nonlinear dynamical systems are characterized by their variables being unpredictable; where Sanders (1998) describes "variables can't be taken apart and added back together again like a child's building blocks; A+B does not equal C" (p.57). The need for complexity thinking became apparent when our 20th and 21st century problem solving and strategic planning models have failed, due to variables, to provide predictable outcomes. According to Sanders, most of our lives are immersed within nonlinear dynamical systems.

Chaos and Complexity

Since Chaos Theory is dependent on the initial conditions and possible consequences through Butterfly Effect; it's important to understand that Complexity theory, as described by Sanders (1998), "describes how order and structure arise through the process of adaptation set in motion by new information" (p.69).   Complex Adaptive Systems, which are nonlinear and receiving new information and adapting with a new shape emerge as a result of the adaptations, and are the product of the need for a new structure to form within a system.

Examples Mechanistic

Examples of mechanistic linear decision making could be: 1) a budget process where capital funds are reserved for an administration building and new construction is planned and accomplished by cause (tax mill) and effect (planning). We do this with my fire department budget for capital improvements, but it's much harder to predict funding needs for salaries and overtime, since it's dependent on variables. 2) Another example of mechanistic is when leadership from the top down gives a directive to accomplish a task and expects it will be done. Little credit is given to how important the communication variable may be.

Examples Complexity Thinking

Examples of Complexity Thinking are prime for fire departments: 1) The predictable attractor state is for the response of equipment to arrive, Assess the situation and establish command, address rescue, evacuation, exposures, ventilation, fire attack, and support functions. (To a novice or untrained spectator the response process would appear chaotic, but there is order within the chaos.) If new information arises to create an incident within an incident, this is where an adaptation of the original system occurs. A higher priority may necessitate deviating manpower and equipment to another incident or system within this incident. This process is ever

changing and dependent upon many forms of new or updated information. Most times these changes are a function of command, but as with ants and their leaving pheromones as an indicator of form emergence, there are "accepted command practices" that allow the fire scene system to adapt and emerge into another from.

References

Sanders, T. Irene (1998). *Strategic Thinking and the New Science,* (22-70)

1. **Facilitator Guide & Lesson Plan**
   a. **(Not all parts below apply to all learning environments, so chose what does and delete the remainder).**

1.1 Dates:

(Write your dates here)

1.2 Subject

RIT self rescue device course

1.3 Table of Contents

Subject   Page Number

_____

1.4 Introduction

1.4.1 Days & Shifts

1.   A-Shift Day, (dates)

2.   B-Shift Day, (dates)

3.   C-Shift Day, (dates)

1.4.2 Facilitator orientation (times)

Lead Facilitator: (Name)

SME Facilitators: (Names)

Supervising Facilitators: Captains of the involved apparatus

Helpers: (Names)

1.4.3 Agenda

1) Setup (Times)

2) (Times) First two rotations (# of hours)

3) (Time) - Lunch

4) (Times) Three 1.5 hour periods

5) Homework - read (Any assigned pre-course materials).

6) Termination of training – (Date and Time)

7) Prep for next day's class – (Details as appropriate

1.4.4 Class Outline (times)

(Details here)

1.4.5 (Subject) Learning Goals, Objectives, & Outcomes

Learning Goals: PFA Training Engine Companies (TEC) and crews will have a working understanding of how (What is the overall goal of this training).

Learning Outcomes: The TEC and crew should have a working understanding of how to train using the (what do you want them to be able to do when done, and at what level?)

Breaks taken as needed during class.

Terminal Learning Objective 1: The Lead Facilitator will provide a brief micro-teach overview of the (The terminal objective, what is necessary and what are the components when combined make-up the whole to achieve the Learning Goal?).

Enabling Learning Objective 2:   The TEC and crew will facilitate the (Learning goals 1 - 5 will be enabling objectives to achieve the Terminal objective)

Enabling Learning Objective 3: The TEC will ((Learning goals 1 - 5 will be enabling objectives to achieve the Terminal objective)

Enabling Learning Objective 4: The TEC will (Learning goals 1 - 5 will be enabling objectives to achieve the Terminal objective)

Enabling Learning Objective 5: The TEC will (Learning goals 1- 5 will be enabling objectives to achieve the Terminal objective)

Note: You may have more than one Terminal objective, so your lesson plan may be very detailed to begin with, but simplify when giving the overview to the companies.

1.4.6 Required Materials

1) (What materials will you need to supply, bring, obtain, procure, find?)

2) (Detailed description of what equipment needs you have, and how they will be configured.)

3) (Detailed description of what equipment needs you have, and how they will be configured.)

4) (Detailed description of what equipment needs you have, and how they will be configured.)

5) RMS Training Code: (fill in as specifically as possible)

(Breakdown hours of class and practical, and have an event created).

1.4.7 Methods: (use methods to support individual problem solving in novel situations)

1. Solid subject domain information available on p.   of PFA (Where is the course information and standards of instruction coming from?)

2. Constructive Learning Environments at each (be detailed here with what they learned), were the learner will build upon their previous knowledge and construct new knowledge from this experience

3. Capturing lessons learned through independent and anonymous survey of participants.

1.4.8 Evaluation: (what form of evaluation will you be using?)

1. Qualitative data based on observation, interview, and survey.

2. Each TEC will be asked to perform (Give a specific review of what they were to do, how it was measured, and which evaluation methods were used)

  (Here is to what standard and level of competency – 100% skill, 100% of the time?)

1.4.9 Required Training Staff

1) (Who will you need from training or other?)

2) PFA Engine Captain supervising

1.4.10 Location (facilities?)

1) PFA Training Center: (Where?)

1.5 Graphical Lesson Plan

1.5.1 July_Graphical_Lesson_Plan (See example below)

W:\doskills_files\2007_do_skills_web\july_files\july_graphical_lesson_plan.doc

2. Apparatus Rotation Matrix

2.1 July07_Apparatus_Rotation (for larger trainings, see examples below)

W:\doskills_files\2007_do_skills_web\july_files\july07_apparatus_rotation.xls

Facilitator Guide & Lesson Plan

PFA DO Pumping Skills - 2006

August 28-B, 29-A, 30-C

Updated September 7, 2006

By: Bill Salmon

Table of Contents

Subject Page Number

_____

Facilitator Guide & Lesson Plan

DO Pumping Skills - 2006

August 28-B, 29-A, 30-C

1. B-Shift Monday, August 28, 2006

2. **C-Shift Tuesday, August 29, 2006**

3. **B-Shift Wednesday, August 30, 2006**

1.1 Introduction

The August D/O Skills will consist of

1.1.1 Instructor orientation 08:30 - 08:45

1) Instructors will set up 100' of 5" hose (from R13) at each of two hydrants inside the training center (the pump pit (yellow) hydrant, and the tower (SE) hydrant.)

2) Instructors will set up Truck 1's (T1) high pressure 5" (125' total) to accommodate the lay from T1's waterway with 25' laid out to the 5" Siamese, and two 50' sections from each side of the Siamese -- toward the engines.

3) Truck 1 crew will set up T1 at 80' elevation, and prepare to flow water to the wetlands at training.

4) Instructor briefing: Review of T1 pumping information (D/O manual on Training website, p. 28), review of safety procedures, including all personnel in the immediate area wearing helmets and appropriate footwear while pumping the engines.

5) Lead instructors: Captain's Jim Salisbury and Bill Salmon.

6) Technical experts: A, B, and C Captains and crews of Truck 1.

7) Truck 2 will be at the training center for the crew of Truck 1 to respond with during the scheduled training.

8) Review the Excel matrix of when companies are scheduled, during conference call.

3

1.1.2 Agenda

1) 08:00 Setup

2) 09:00 - 12:00 two companies at a time rotation; truck 1 at training center all day

3) 12:00 - Lunch

4) 12:30 - 17:00 two companies at a time rotation: truck 1 at training center all day

6) Termination of training

7) Prep for next day's class

1.2 Class Outline

1.2.1 09:00 - 12:00 (90 minute segments, beginning at 09:00 & 10:30)

12:30 - 17:00 (90 minute segments, beginning at 12:30, 14:00 & 15:30)

1.2.1.1 Two Engines Pump Two Separate Hydrants to Truck 1 Siamese

Learning Goals: PFA Training Engine Companies (TEC) D/O's and crews will have a working understanding of how to lay from a hydrant to T 1's high-pressure 5" hose and supply T1's Siamese as one of two engines, achieving 2000 GPM flow from T1.

Learning Outcomes: The TEC D/O and crew should have a working understanding of how to train using 5" hose, a hydrant, and using their engine pump to the Siamese of Truck 1 with demonstrated competency.

Breaks taken as needed during class.

Learning Objective 1: The instructor will provide a brief micro-teach overview of the hydrants, hose layout, engine positions, and truck1 specific knowledge. A Water Supply Officer will be assigned to coordinate the engines with Truck 1.

Learning Objective 2: The TEC D/O and crew will facilitate the setup of the provided 5" hose to their engine, and prepare to flow 1000 GPM.

Learning Objective 3: The TEC D/O and crew will facilitate the setup of the high pressure 5" from the Siamese to their engine.

Learning Objective 4: The TEC D/O and crew will flow to the Siamese (see [D/O manual](#) for specifics) as the first engine, while communicating with the truck D/O to

4

ensure proper flows and safety.

Learning Objective 5: The TEC D/O and crew will flow to the Siamese (see [D/O manual](#) for specifics) as the second engine, while communicating with the truck and second engine D/O's to ensure proper flows and safety.

Learning Objective 6: The TEC D/O and crew, as the first relay engine, will establish two 5" hose layouts from two separate hydrants of similar pressure and volume to both sides of their pump intakes. They will then prepare to pump through 5" hose to a second engine (in relay) to boost their pressure to just below 150 psi.

Learning Objective 7: The TEC D/O and crew will, as the second relay engine, receive from the first relay engine a 5" (doesn't need to be HP 5") to their pump intake. They will then ensure a clear lay of HP 5" is attached from Truck 1 to the non-Pump Panel side of their engine. There should be no Siamese/Wye attached in this hose configuration. This hose may be many hundreds of feet of HP 5" away from the truck. They will then prepare to flow 2000 GPM to Truck 1, at 255 psi to Truck 1's tailboard. This engine can expect 300 psi EP to achieve this flow.

Learning Objective 8: The TEC D/O's and crews, under the supervision of the Water Supply Officer, will coordinate learning objectives 6 & 7 to accomplish 2000 gpm to Truck 1 (255 psi at the tailboard guage). Each engine should watch engine temperatures and oil pressures. Each engine should be in pump volume mode.

1.2.1.1.1 Required Materials

See July D/O Skills Page on Training Website for applicable resources:

1) 2 x PFA Engine and crew

2) Truck 1: 1 x 25' of high pressure 5" hose; 2 x 50' sections of high pressure 5" hose; 1 x 5" Siamese ; 400' of HP 5" is now available for this evolution.

3) 6 x 100' of R13 5" hose placed at pump pit and SE tower hydrants

5) JPR's 12d & 12e: for D/O to review (Available on Training Web Page) under August D/O Skills

7) RMS Training Code: 19-10, 19-11, 19-13

5

1.2.1.1.2 Required Training Staff

1) Captain Jim Salisbury & Captain Bill Salmon, or Facilitator Guide

2) Two PFA Engine Captain's supervising engine D/O's

3) Truck 1 Captain and crew

1.2.1.1.3 Location

1) Cul-de-sac of training facility

1

INSTRUCTIONAL PLANNING GUIDE

Title __Two Engines Pump to Truck 1_____ Page ___1___of __1____

Instructor __Captain Jim Salisbury_____ Date _August 28, 29, 30, 2006_____ Time _09:00 – 17:00_____

Goals	Objectives	Methods	Evaluation	Time	Materials & Media	Facilities	Notes
PFA Training Engine Companies (TEC) D/O's and crews will have a working understanding of how to lay from a hydrant to T 1's high-pressure 5" hose and supply T1's Siamese as one of two engines, achieving 2000 GPM flow from T1	See Facilitator's Guide for Objectives: 1, 2, 3, 4, 5	PDF of JPR's 12d &e Micro Teach & Demonstration	Participants will be asked to complete e-survey in their stations upon completion of training	90 minute classes	See Facilitator's guide for Required Materials D/O manual (p. 26 & 27) Available at the D/O Skills tab on the Training Web site.	Cul-de-sac at training facility	See Tra Website D/O Ski Tab, Au 2006 D/ pumpin Skills fo Facilitat Info