

LEARNING THE LESSONS OF LEADERSHIP EXPERIENCE: TOOLS FOR INTERACTIVE CASE METHOD ANALYSIS

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ABSTRACT

The Army Excellence in Leadership (AXL) project at the University of Southern California's Institute for Creative Technologies is aimed at supporting the acquisition of tacit knowledge of military leadership through the development of compelling filmed narratives of leadership scenarios and interactive training technologies. The approach taken in the AXL project is to leverage the best practices of case-method teaching and use Hollywood storytelling techniques to create fictional case studies (as filmed media) addressing specific leadership issues. In addition to authoring compelling cases for analysis, we have developed software prototypes that instantiate the case-method teaching approach. These systems engage individual trainees in human-computer dialogues that are focused on the leadership issues that have been embedded in the fictional cases.

1. INTRODUCTION AND MOTIVATION

Given the rapid pace of Army deployments in global hot spots, there is an existing and ever growing need to accelerate the development of the Army's young leaders. Leadership is a topic that is challenging both to teach and to learn. Unlike basic soldiering skills that can be taught and practiced as an explicit set of procedural steps, leadership is a form of expertise that is difficult to articulate and transfer to others using a standard approach to task training.

Research on leader development shows that expertise is gained primarily through experience and by taking time to reflect on the lessons learned from an episode (Hughes, Ginnett, & Curphy, 2002; McCall, Lombardo, & Morrison, 1988; Sternberg et al., 2000). The combination of experience and reflection eventually leads lessons to become part of the tacit knowledge of the practitioner.

In an ideal world, leaders would be developed by providing them with just the right set of experiences from which to learn. The challenge for the Army is how

to develop leaders who can function in the current operating environment before they've experienced it. This is particularly true today, as the Army's warfighters are faced with extremely stressful and demanding situations that are "close to war" but are not covered by standard tactics and doctrine.

1.1 Think Like A Commander

Previously, the Army Research Institute and the Army's Command and General Staff College at Fort Leavenworth developed a training technique called "Think Like a Commander" (TLAC). In TLAC, a tactical scenario is presented using a slide presentation, and a tactical senior mentor leads a class of students through a structured analysis of the case. Students participate in the analysis of eight different facets of the scenario:

1. What is the mission? What is the commander's intent?
2. What is the threat?
3. What are the effects of terrain on the situation?
4. What assets are available?
5. What is the role of timing in this situation?
6. What is the big picture of what is happening?
7. How would you visualize the battlefield?
8. What contingencies should be considered?

The classroom mentor's role is to engage the students in an open discussion about each of these issues. Learning takes place in two ways. First, the students learn a particular case in great detail. The discussion inevitably brings out alternate points of view, and students may find their assertions challenged. The result is a deeper understanding of the issues. Second, students learn the TLAC case analysis process itself, which is a general method for critical thinking and analysis. One of the goals of TLAC is to habituate commanders to approach any scenario with these questions in mind.

1.2 Tacit knowledge of military leadership

With the TLAC approach, the primary focus is on analyzing a tactical problem around a framework that already exists and has been presented to the students. With the TLAC approach as our starting point, we began

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to investigate how to interleave leadership issues into a tactical scenario so that students could see and explore the ways that specific leadership techniques can impact an operation. Our aim was to design appropriate developmental experiences for leaders that would generate deep tacit knowledge and enable them to adapt to and succeed in new and changing situations.

Sternberg et al. (2000) identified three major categories of tacit knowledge: intrapersonal, interpersonal, and organizational. Interpersonal skills are particularly challenging for leaders. McCall, Lombardo, and Morrison (1988) identified the top ten fatal flaws of leaders, and most of them involved some deficiency in interpersonal skills: insensitivity to others, arrogance, betrayal of trust, failing to deal with performance problems, over-managing, unable to adapt to a boss with a different style, and so on. Sternberg and his colleagues found that interpersonal tacit knowledge is among the most called upon tacit knowledge of U.S. Army officers, but in particular for captains and advanced lieutenants. Company commanders deal most with interpersonal issues in their leadership roles, and interpersonal issues also make up a significant portion of platoon leaders' responsibilities. Our work has focused on leader development of interpersonal tacit knowledge for junior leaders, and previous research bears out that the need is great.

It is impractical to provide all of the real-life experiences that would be needed to prepare trainees for the complex interpersonal issues facing soldiers today, so other forms of support for leader development are needed. Sternberg et al. (2000) suggests that an alternative way of acquiring tacit knowledge for leader development is through the use of rich stories, which serve as a launching point for a dialogue about specific issues.

A related approach for acquiring tacit knowledge about leadership is through the use of case-method teaching, where students analyze a realistic case with the help of an experienced instructor-facilitator. While a story is a powerful medium for communicating another's experience, a mentor can reinforce the salient points to be learned (Sternberg et al., 2000). Effective tutors create scaffolding or build a framework in a dialogue that leads to the construction of new knowledge for the student. Also, Chi et al. (2001) studied what makes learning with human tutoring effective and found that, among other things, tutoring is interactive by nature. Interactivity motivates the student more than passive listening. A number of studies have found that student reflection – promoted by asking the student to generate explanations and additional questions – can result in deeper learning (Chi et. al, 2001; Graesser et al., 2002).

1.3 Army Excellence in Leadership (AXL)

The Army Excellence in Leaders (AXL) project at the University of Southern California's Institute for Creative Technologies in collaboration with the Army Research Institute's (ARI) Leader Development Research Unit (LDRU) at Ft. Leavenworth aims at supporting the acquisition of tacit knowledge of military leadership through the development of compelling filmed narratives of leadership scenarios and interactive training technologies.

The approach taken in the AXL project is to leverage the best practices of case-method teaching and use Hollywood storytelling techniques to create fictional case studies (as filmed media) addressing specific leadership issues.

In addition to authoring compelling cases for analysis, we have developed software prototypes that formalize the case-method teaching approach. These systems engage individual trainees in human-computer dialogues that are focused on the leadership issues that have been embedded in the fictional cases.

This paper describes the Army Excellence in Leadership (AXL) project. Section 2 describes our case-method teaching approach, including our approach to the development of fictional filmed cases using Hollywood storytelling techniques. Section 3 describes our efforts in developing interactive software applications to support effective case-method teaching around these cases. Section 4 provides an analysis and summary of the work on the project.

2. CASE-METHOD TEACHING

Developmental experiences often start with a failure of some sort—leaders are caught short and find that they are in situations where they are unable to deal with the issues confronting them. The shortcoming can become an opportunity to explore the alternatives for dealing with an issue or situation. When the leader comes face to face with the inadequacy or gap in his knowledge, he or she must foster new methods for solving a problem or dealing with people. Learning occurs when leaders find a way to bridge the gap (Forsythe, 2004). The lessons of experience are powerful and under the right conditions will shape the leader who can learn from them through a process of reflection and the guidance of a mentor (McCall, Lombardo, and Morrison, 1988; Schon, 1983).

While first-hand experiences, along with reflection and guidance, are great teachers, they can be quite expensive: it may take years to obtain the knowledge that is needed for a particular job assignment, and in extreme

cases a misstep can be deadly. In today's Army (and in the business world), leaders do not always have the luxury of experience when taking on an assignment outside their specialty and knowledge. Case method teaching acknowledges this reality and aims to develop tacit knowledge that will prove portable and adaptable. In the rest of this section we will discuss the characteristics of the case method approach, why it is an appropriate technique for teaching about leadership, where the learning occurs, and how the principles of this approach can be implemented in an online tool that can be used either in a classroom or as a distance learning application.

2.1 Overview of case-method teaching

Harvard Business School put case method teaching into practice a century ago as a means of preparing students for related but not exactly similar situations that they could face in the real world. The case method approach provides a means of learning from the challenges and mistakes of others. A case is a synopsis of the experiences, decisions and actions of others that can be studied and provide a vicarious learning experience by placing the student in the shoes of another. By studying many cases, a student can compress the experiences of others into a shorter span of time, with the added benefit of not suffering the consequences of the mistakes made by those studied.

Case teaching is effective because it encourages not only experiential learning but also active participation, resulting in deeper understanding and improved retention. The problem presented in the case is discussed with a group of people, where alternative points of view will challenge the student, even causing them to reassess their own position on an issue. By both listening to others and presenting one's own views, the student has the opportunity to develop interpersonal skills as well as critical thinking skills.

One of the primary characteristics that makes a case worthy of study is whether it presents a real world situation containing the same types of problems, issues and dilemmas the students will face as decision-makers. But a good case should present more than a technical or tactical problem—leadership is not a purely technical skill. Leadership requires a deep understanding of people. Thus, cases can be used as a way of exploring the decisions that were made as well as the reactions of the people who were involved, thus giving greater insight into the nature of people in different contexts (Gargg, 1940/1982). Understanding how other people behave and make decisions is one of the keys to growing in the interpersonal dimension of leadership.

2.2 Guided versus discovery learning

Learning through case method teaching is generally inductive in nature. A situation is presented to a student, who analyzes it and derives an explanation of what happened and why. However, there is some variance among case method practitioners as to how much guidance the student is given during the learning process. At one end of the spectrum, practitioners view the process as being totally inductive. They take what is known as the discovery approach that places the burden on the student to formulate explanations and theories without any guidance. There are problems with this approach, however, and it has been shown to be less effective than guided discovery (Mayer, 2004). We are proponents of providing some guidance during the case method analysis. We agree with Halpern (2004) that providing questions, analysis methods and direction enhance the learning process.

2.3 What makes a good case?

A case should typically have three to five major issues or themes related to the learning goals set by the instructor (Golich et al., 2000). It should be rich in details so that the student can experience the complexities, subtleties, ambiguities and uncertainties of a situation. Like a story, a case has both a plot and characters. What makes the case interesting is when multiple interpretations are possible. Rather than presenting a case that is black in white in nature, where little discussion is needed, it is essential that the case not have a clear-cut solution. Finally, a case should be, as much as possible, based on real world events (Gragg, 1940/1982).

2.4 Role of student: prepare for participation

To set the stage for a successful classroom, the students must thoroughly prepare the case ahead of time. There are three basic stages to student preparation: familiarization, analysis, and developing recommendations. During familiarization, the student first skims the case, looking for themes, issues and problems (Corey, 1999). If the teacher provided study questions, the student is expected to review them prior to making the detailed review of the case. Once the major themes and issues have been outlined, the student is ready to perform a detailed analysis, beginning with a careful reading of the case and its appendices. The student should outline in more detail the problems in the situation, the people and parties involved and their reactions to the situation, the assumptions made, and the evidence for and against the decisions that were made. Finally, once the problems have been analyzed, the student should formulate recommendations for addressing the issues in the case (Golich et al., 2000).

2.5 Role of instructor: orchestrate the discussion

When leading a case discussion, the instructor acts like an orchestra conductor rather than a lecturer (Golich et al., 2000). In this metaphor, the role of the instructor is to elicit participation by all the students, while attempting to coordinate their individual inputs. The art of facilitating the discussion involves tracking and guiding the discussion by asking key questions, encouraging the students to construct knowledge rather than being told what to think, and provide feedback that challenges or affirms the viewpoints articulated during the discussion. To achieve this, the teacher has to keep in mind the desired learning outcomes and have a map of questions that will lead toward the goal (Gentile, 1990). The question map may resemble the preparation process taken by the student, going through stages of familiarization, analysis, and developing recommendations.

During the familiarization stage of the class discussion, the questions will establish the groundwork for the subsequent analysis. Open-ended questions like: “what was going on here?”, “who were the actors?”, and “what led to failure here?”, serve to establish the issues in the case as well as warming up the participants for the potentially more intense phases that follow (Golich et al., 2000).

During the analysis phase, the teacher guides the discussion by asking questions that begin to drill down on the sources of the problems identified during the case familiarization. Examples of drilling down include examining the underlying assumptions of the various actors’ decisions, the factors that influenced the outcome, and taking a critical look the appropriateness of the actions and decisions of the actors. The case discussion is a democratic process: the role of the students is to voice their opinions, listen to the viewpoints of others, and challenge others’ assertions in an appropriate manner. All the while, the teacher guides the discussion to keep it on track and moving in the direction envisioned in the lesson plan.

The goal of the final phase of the discussion is to make recommendations and evaluate alternative courses of action. One way of guiding students toward this goal is to ask a hypothetical question about what might have resulted if an actor had taken a different action, or ask for a prediction of what might happen next in the scenario. As solutions are generated and discussed, the teacher guides the class toward a set of potential solutions that could be applied in the case. In the end, the teacher provides a summary of the issues and solutions that cap the learning experience.

2.6 Where does the learning occur in the case method approach to teaching?

Learning with the case method occurs at each of the stages outlined above. The key is to have the students first grapple with the case on their own and then in a social context with a teacher. Other class participants provide varying insights and critiques that would not have otherwise been considered, so it is important that the students listen to others. Through participation and group discussions, students learn not only how to apply their critical thinking skills, but they also learn how to articulate a position, listen to others, and compare alternative views for their relative merit.

The teacher must follow the discussion as closely as the students. A skilled teacher leads the class through a discussion in a manner that maximizes the construction of knowledge. They do so by keeping the discussion on track with an overall question map but without spoon-feeding answers. A well-selected and well-constructed case will contain ambiguities so that there will not be clearly defined right and wrong answers. Rather, there will be candidate solutions or recommendations that have pros and cons. By encouraging students to actively participate, a teacher enables exploration of these possibilities and thereby maximizes the learning opportunities.

2.7 “Power Hungry”

In 2002, we constructed, authored, and filmed an initial case about military leadership at the company level. The case was presented as a short fictional film entitled “Power Hungry.” The situation is a security mission for a food distribution operation in Afghanistan. In the scenario, a new company commander (CPT Young) is seen making a number of questionable leadership decisions, which ultimately lead to the failure of the mission as a food riot erupts among the civilian population.

To ensure realism, the leadership issues in the fictional scenario are based on the real-life experiences of captains who had recently completed their assignment as company commanders. A team from ICT and ARI interviewed ten captains who were assigned to become tactical officers at the United States Military Academy. Each interviewee was asked to tell stories that illustrated the leadership challenges they experienced as a commander. With this method, sixty-three stories were gathered and subsequently categorized by leadership issue. We selected a subset of these issues as the basis for the leadership points that were interwoven with the Power Hungry scenario.

The Power Hungry account of a food distribution operation set in Afghanistan was developed with guidance from Army subject matter experts from the Center for Army Leadership at Ft. Leavenworth. The mission in the scenario was selected for its relevance to the Army's contemporary operating environment. Since the learning objectives were centered on leadership, however, a fine line had to be walked in designing the experience. We realized that the temptation for many of the students would be to focus on the tactical problem confronting the commander—how to best provide site security, where to deploy his troops, and so on. While these are crucial questions, we wanted to create a different focus for the analysis of the case. Our goal was to create a context for discussing the interpersonal and cultural factors that led to the failure, thus special attention is given in the film to the relationships between the company commander and his subordinates, the local warlord, and a command sergeant major from brigade headquarters.

In the end, Power Hungry is a fictionalized account that was written using Hollywood techniques to maximize engagement with and impact on the viewer. The leadership issues that arise in Power Hungry were inspired by the stories collected from former company commanders, which provides a link to real world events. There are several positive outcomes of this approach: it motivates students to discuss the case, it helps establish memories of the leadership issues, and it compresses many experiences and issues into a single scenario.

In contrast, TLAC and other battle command style case studies typically use a map, sand table, or digital plan view display to provide a high level view of the situation. While this provides a highly effective forum for discussing the tactical considerations of a case, the limitation of this approach is that it does not reveal the interpersonal aspects of leadership that have a bearing on an operation. By presenting the case as a film-based narrative, instructors are able to engage the students at an emotional level. The characters in the story illustrate the kinds of personalities, attitudes, communication, and leadership styles that are often present in a unit.

3. TECHNOLOGIES FOR SELF-DIRECTED CASE METHOD LEARNING (TLAC-XL)

The Power Hungry vignette is currently being used effectively by the instructors in a classroom-based leadership development course for junior Army officers (Zbylut and Ward, 2004). To support this effort, members of ARI's Leadership Development Research Unit wrote an instructor's guide to help in the facilitation of classroom discussion. The broader vision of the Army Excellence in Leadership (AXL) project, however, is to

also provide an on-line capability for self-directed case method learning. To that end, we developed an interactive software application that would allow soldiers to conduct an analysis of the Power Hungry case on an individual basis. Our aim was to create an interactive experience that allowed users to engage in many of the same sorts of analysis and critical dialogues that would occur among peers and with an instructor-facilitator in a classroom environment, only using human-computer dialogue with virtual characters instead.

Our first prototype software application was entitled *Think Like a Commander: Excellence in Leadership* (TLAC-XL), described by Hill et al. (2003). Inspired by case-method teaching techniques described in the previous section, TLAC-XL follows a two-step approach: familiarize (watch the movie), and analyze the leadership issues. The analysis step is enabled using a natural-language human-computer dialogue interface, where the trainee has conversations with the characters from the movie and with a virtual coach who guides them through the leadership issues (Figure 1).

The overall structure of the conversations in TLAC-XL is based on the original eight Think Like a Commander points used in the system built by the Army Research Institute. A photo-real animated character serves as a synthetic coach in TLAC-XL, who poses questions to the trainee about each of the eight TLAC points. Trainees respond to these questions by typing their replies, which are then analyzed by the system's statistical text classification algorithms to identify whether the coach will agree or disagree with their analyses.

Six specific leadership issues were embedded into the Power Hungry storyline, and are related to these eight TLAC points, each in a specific way. After introducing a TLAC point, the synthetic coach asks the trainee their opinion on one of the related leadership issues. Then the user is permitted to investigate further by interviewing a character from the movie about the specific leadership issue. Trainees type questions to these characters, which are then analyzed to determine the most appropriate response from a set of pre-recorded video clips. An average of 16 possible responses are provided for each of the characters that can be interviewed, each a few sentences in length. In addition, a shorter, single-sentence response is delivered to the user in cases when the system infers that the user is asking the same question more than one time.

Below is a transcript of a sample conversation between a user, the synthetic coach, and a storyline character. This is representative of the structure of conversations around each of the five TLAC points (of the eight) that have related leadership issues. In this case,

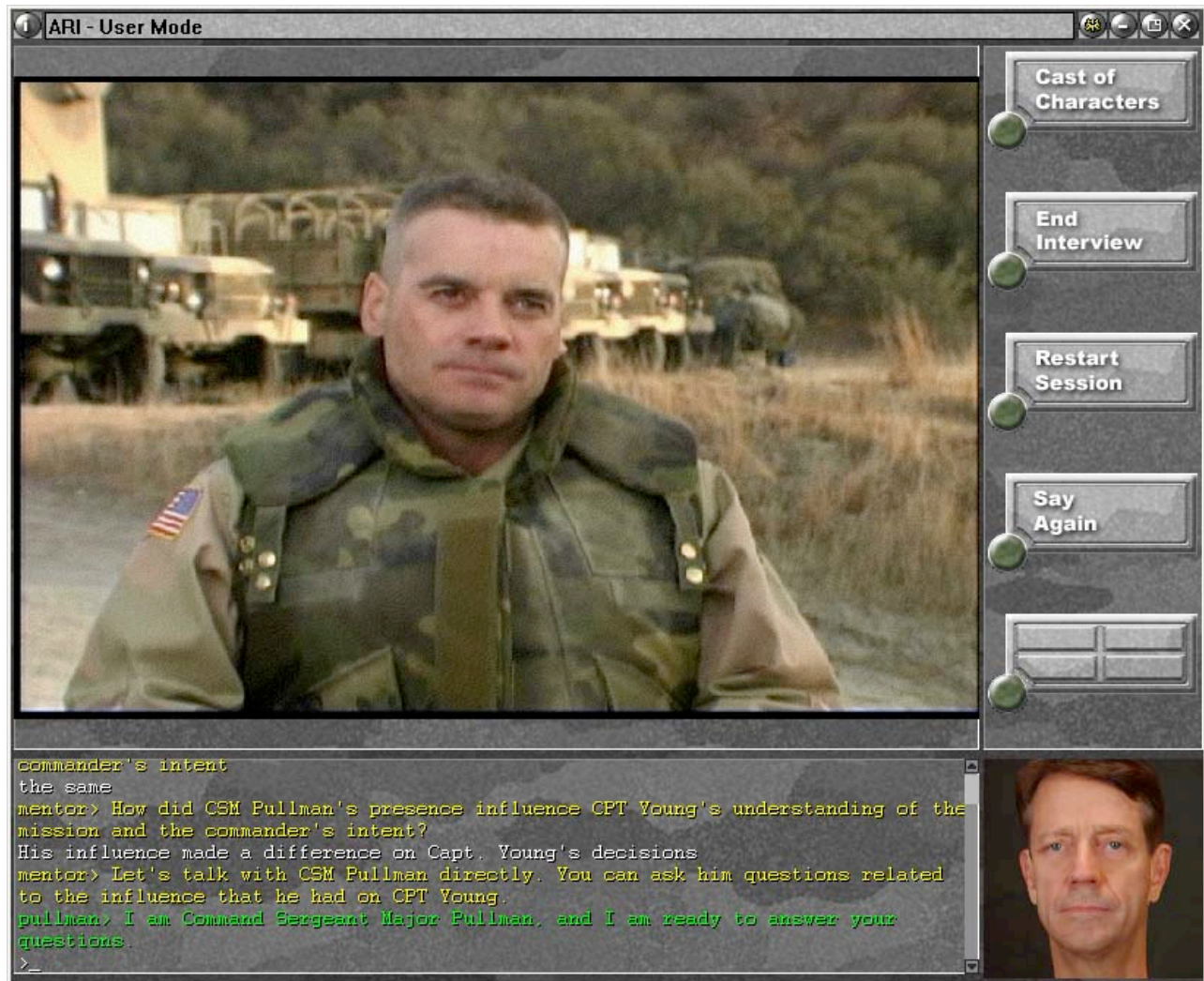


Figure 1. The TLAC-XL Application Prototype of the Army Excellence in Leadership Project

the TLAC point concerns the mission, and the leadership point concerns the influence that people outside of the chain of command should have in the decision-making process of a commander.

Coach: Let's begin by talking about the mission. What is your understanding of the mission and the commander's intent?

User: This was supposed to be a standard food distribution operation.

Coach: What do you think was CPT Young's understanding of the mission and the commander's intent?

User: The same – distribute the food and make a good impression on the local population.

Coach: How did CSM Pullman's presence influence CPT Young's understanding of the mission and the commander's intent?

User: I don't know

Coach: Let's talk with CSM Pullman directly. You can

ask him questions related to the influence that he had on CPT Young.

Pullman: I'm CSM Pullman, and I'm ready to answer your questions

User: Were you trying to influence the Captain in this mission?

Pullman: Any suggestions, recommendations, advice I gave to CPT Young was just that. If he took it to heart, hey - that is what advice is for. I assume he used it because it made sense to him. If he did it for some other reason - I know the word is that I have an office right outside the Brigade Commander's door – then that's his problem, isn't it. Young's in charge. Period. He makes the decisions. If he decides to listen to me just because of the stripes on my collar, that's his decision, too.

User: So you weren't trying to influence him.

Pullman: I never thought about the effect of anything I said on CPT Young's command decisions, and that is all I have to say about it.

User: [clicks “end interview” interface button]
Coach: What do you think of CSM Pullman’s comments on the influence that he had on CPT Young.
User: He wasn’t influencing him at all.
Coach: I disagree. CSM Pullman may not believe that he had an influence on CPT Young. However, his presence certainly caused CPT Young to question his understanding of the mission.

During the analysis of each issue, the student gathers more information by interviewing characters from the story to get their perspective on the situation. Questions are asked in a natural form where student generates their own inquiries without the aid of menu-driven options. This approach reinforces the underlying philosophy that students learn by actively analyzing a situation by generating questions and answers in a system that supports this kind of structured discourse.

We conducted a set of evaluations to determine the effectiveness of the machine-learning approach used to perform statistical text classification in TLAC-XL. Six classifiers were evaluated for each of the character conversations and the six classifiers used in determining agree/disagree feedback from the coach. Each of these classifiers was trained using hand-classified inputs collected during evaluations of the TLAC-XL system with US Army soldiers, with an average of 356 training examples for character interview classifiers (divided among an average of 16 classes and 68 examples for the coach response classifiers (divided among 3 classes). Word-level features (unigrams and bigrams) were used to encode the training data, without stopwords, ignoring case, and removing punctuation. The evaluation technique of cross-validation (10-fold) was used, where successive fractions of the training data is withheld and tested against the classifier trained on the remaining data. Using a Naïve Bayes machine-learning algorithm, character interview classifiers selected the most appropriate class for test data an average of 51.9% of the time, with the most appropriate coach response selected 76.1% of the time.

The Army Research Institute’s (ARI) Leader Development Unit conducted evaluations of the effectiveness of the TLAC-XL prototype with junior officers in 2003 and 2004. A report on these findings also appears in these conference proceedings in a paper by Zbylut & Ward (2004).

4. DISCUSSION AND FUTURE DIRECTIONS

The Army Excellence in Leadership project at the University of Southern California’s Institute for Creative Technologies has demonstrated the applicability of Hollywood storytelling techniques and interactive

software technologies to the challenge of leadership development for junior Army officers. In developing our first case, the Power Hungry video, we have shown how fictional live-action narratives can be constructed with specific leadership issues in mind, which are woven into a storyline that is both engaging and provocative. In developing our first interactive software prototype, the TLAC-XL system, we have shown that statistical text classification technologies are sufficient to engage users in substantive conversations about these leadership issues with virtual storyline characters and a virtual coach.

As this research effort moves forward, we are applying the lessons learned from these two efforts to address new leadership issues by creating new fictional video case studies, and developing new technologies to better support effective case-method instruction in interactive software systems. Traditional classroom approaches to case-method teaching (with more conventional case materials) are likely to continue to have an important role in the development of effective military leaders. However, the aim of our effort is to both improve the quality of classroom-based instruction through the creation of more compelling and targeted cases, and to enable effective leadership development for trainees outside the classroom.

In 2004 we began the process of refining the TLAC-XL concept based on the feedback from the ARI evaluations (Zbylut and Ward, 2004) as well as a review of leader development and case method teaching literature. While TLAC-XL was effective, we felt that the user experience could more closely parallel the steps and aims of the case-method teaching process described in this paper. The new Army Excellence in Leadership (AXL) system that we are in the process of developing places more emphasis on scaffolding a trainee’s formulation of an analysis of a case and on a critique of the trainee’s analysis by peers and more experienced leaders recorded on video. In addition, we plan to add a stage to the process whereby the students formulate recommendations for how they would have handled the problem differently, had they been there.

In a departure from the PC-based approach to deploying TLAC-XL, we are currently investigating the practicalities of moving the entire user experience online to facilitate the social aspects of case-method learning, to ease in the collection of training data to improve our statistical text classification algorithms, and to enable researchers at the USC Institute for Creative Technologies and the Army Research Institute to better conduct evaluations of training effectiveness. In so doing, the case method tools and media would be more accessible to a wider audience.

The techniques and technologies developed within this scope of this project have application beyond United States Army officer leadership development, both within and outside the military. The most direct reapplications of this work would be for leadership development in other branches of the military, targeted to other echelons of military units. Likewise, the leadership principles investigated in this work are broadly applicable to other leadership domains, such as corporate management training and the development of government officials. More broadly, the creation of new fictional video cases may enable effective case-method teaching in support of skills that are not directly focused on leadership, such as teacher professional development, crisis management education, and even procedural skills training.

The research progress that we have made in this project offers compelling evidence in favor of continued collaborative efforts between the United States Army, research computer scientists, and the Hollywood storytelling community.

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REFERENCES

- Chi, M., Siler, S., Jeong, H., Yamauchi, T., Hausman, R., 2001: Learning from Human Tutoring, *Cognitive Science* 25, 471-533.
- Corey, E. R., 1999: A Note on Case Learning. Report 9-899-105. <http://www.hbsp.harvard.edu>. Harvard Business School Publishing, Boston, MA, 02163.
- Forsythe, G., 2004: From an interview at West Point on July 1, 2004.
- Gentile, M. C., 1990: Twenty-Five Questions to Ask As You Begin to Develop a New Case Study. Report 9-391-042. <http://www.hbsp.harvard.edu>. Harvard Business School Publishing, Boston, MA, 02163.
- Golich, V., Boyer, M., Franko, P., Lamy, S., 2000: The ABCs of Case Teaching. *Pew Case Studies in International Affairs*. Institute for the Study of Diplomacy, Edmund A. Walsh School of Foreign Service, Georgetown University, www.guisd.org.
- Gragg, C. I., 1940/1982: Because Wisdom Can't Be Told. Harvard Alumni Bulletin, October 19, 1940. Reissued by Harvard Business School, Report 9-451-005, Rev. November 30, 1982. McGraw-Hill Companies, 2001.
- Halpern, D., 2004: The Development of Adult Cognition: Understanding Constancy and Change in Adult Learning. In *Leader Development for Transforming Organizations: Growing Leaders for Tomorrow*, edited by David V. Day, Stephen J. Zaccaro, and Stanley M. Halpin. New Jersey: Lawrence Erlbaum Associates, Publishers.
- Hill R., Douglas, J., Gordon, A., Pighin, F. and van Velsen, M., 2003: Guided Conversations about Leadership: Mentoring with Movies and Interactive Characters. *Proceedings of the Fifteenth Innovative Applications of Artificial Intelligence Conference (IAAI-03)*, August 12-14, 2003, Acapulco, Mexico. Menlo Park, CA: AAAI Press.
- Hughes, R., Ginnett, R., and Curphy, G., 2002: *Leadership: Enhancing the Lessons of Experience*. San Francisco: McGraw-Hill Irwin.
- Mayer, R., 2004: Should There Be a Three-Strikes Rule Against Pure Discovery Learning?: The Case for Guided Methods of Instruction. *American Psychologist*, January 2004.
- McCall, M., Lombardo, M., & Morrison, A., 1988: *The lessons of experience: How Successful Executives Develop on the Job*. New York: The Free Press.
- Schon, D., 1983: *The Reflective Practitioner: How Professionals Think in Action*. Basic Books.
- Sternberg, R., Forsythe, G., Hedlund, J., Horvath, J., Wagner, R., Williams, W., Snook, S., and Grigorenko, E., 2000: *Practical Intelligence in Everyday Life*. New York: Cambridge University Press.
- Zbylut, M. & Ward, J., 2004: Developing Interpersonal Abilities with Interactive Vignettes. *Proceedings of the 2004 Army Science Conference*, Orlando, FL.