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Improving the Understanding of the Impact of Creative Problem Solving Training through an Examination of Individual Differences

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Improving the Understanding of the Impact of Creative Problem Solving Training through an Examination of Individual Differences

by

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An Abstract of a Thesis
in
Creative Studies

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

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State University College at Buffalo
Center for Studies in Creativity

ABSTRACT OF THESIS

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This thesis addressed the relationships between students who reported enjoyment of learning and the perceived future value of using the various components, stages and tools of the Creative Problem Solving (CPS) process, and their CPS styles as measured by the Buffalo Creative Process Inventory (BCPI). Data was collected using the BCPI and an end-of-course survey in both graduate and undergraduate introductory CPS courses from January through December 2000. A key quantitative outcome revealed that the principles and tools in relation to the divergent thinking aspect of the CPS process were the most enjoyable to learn and rated the highest future value. Key qualitative outcomes described the CPS principle 'Deferring Judgement' as a significant learning from the course, as well as the incorporation of course principles into one's personal and professional lives. In contrast to the overall positive response to divergent thinking, individuals with High Ideator and High Developer preferences indicated that they did not enjoy or see much future value in these tools and principles. An implication suggested the relevance of using the BCPI in order to maximize transference of learning in the introductory CPS course. Recommendations for future research and study replication were discussed.

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Date

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Dedication

I would like to dedicate this thesis to the loving memory of my grandmother, Harriet Elizabeth Weimer Mix. On Thanksgiving Day 1999, I promised you when I concluded my thesis research it would be dedicated in your honor. From the time I was an infant to the day you entered the Lord's home, I want to thank you for teaching me many of life's lessons and for building the foundation for which I stand upon today.

The poem below will forever remind me of the gift you gave me, your love. Thank you for always giving me your unconditional love, encouragement and support.

The Rose Beyond the Wall

A rose once grew where all could see,
sheltered beside a garden wall,
And, as the days passed swiftly by,
it spread its branches, straight and tall…

One day, a beam of light shone through
a crevice that had opened wide ~
The rose bent gently toward its warmth
then passed beyond to the other side…

Now, you who deeply feel its loss,
be comforted ~ the rose blooms there ~
Its beauty even greater now,
nurtured by God's own loving care.

-Author Unknown

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Chapter One: Background and Statement of the Problem

Introduction

The purpose of this research is to investigate the impact of Creative Problem Solving (CPS) training through the analysis of individual differences. This chapter focuses on the importance of the impact of CPS training and its relation to individual differences, more specifically, cognitive styles. This chapter begins with a historical account of the development of CPS and current frameworks in use, as well as the impact of CPS training on people's lives. The Creative Studies project of the early 1970's and the Cognitive Styles project of the 1980's conducted at the Center for Studies in Creativity are briefly reviewed. The chapter continues with the statement of significance and the specific questions that guided this thesis. It concludes with a chapter summary and a preview of Chapter Two.

Historical Development of Creative Problem Solving

In an effort to better understand the multi-faceted phenomenon known as creativity, Rhodes (1961) set out to find a universal definition of creativity. He believed that creativity "when analyzed, as through a prism, the content of the definitions form four strands" (p. 307). These four strands Rhodes refers to are person, product, process and press. This framework for understanding creativity has become a ‘cornerstone’ for previous and current research conducted by the Center for Studies in Creativity at Buffalo State College.

Osborn (1979) introduced the structure of CPS as a method for solving problems creatively. The first CPS process depicted three distinct stages: Fact-Finding, Idea-Finding and Solution-Finding. The concepts of deferred judgment and quantity yielding quality were also

explored. Imaginative and judicial thinking were brought forth to demonstrate that people engage in both types of thinking. These fundamental beliefs set forth by Osborn have prompted those who followed to continue to research and develop the CPS process. The CPS process would evolve from three to five stages, to include Problem-Finding and Acceptance-Finding (Noller, 1977; Noller, Parnes & Biondi, 1976; Parnes, 1967; Parnes, Noller & Biondi, 1977). The Problem-Finding stage was developed to discover the broad perspective of the situation; and Acceptance-Finding allows individuals to consider how an idea or option will succeed or fail.

Isaksen and Treffinger (1985) introduced a revision in the framework of CPS. This modification introduced the sixth stage of Mess-Finding and renaming the stage Fact-Finding to Data-Finding. Prior versions of CPS described rules for divergent thinking (Noller, 1977; Noller, Parnes & Biondi, 1976; Parnes, 1967; Parnes, Noller & Biondi, 1977); however, Isaksen and Treffinger (1985) strengthened the concept of "dynamic balance." They believed that "in CPS, we learn to use effective methods for generating *and* evaluating ideas, and we try to accomplish a reasonable balance between 'diverging' and 'converging.'…We talk about this as the 'dynamic balance' that makes CPS powerful and productive" (p. Two-5).

Isaksen, Dorval and Treffinger (1994) further revised the CPS framework by describing it in three distinct components and six stages. The three components were described as "Understanding the Problem, Generating Ideas and Planning for Action" (p. 60). The authors also introduced the step of Task Appraisal. Isaksen, Dorval and Treffinger argued "to get the most from using CPS it is necessary to understand the people who are involved; the situation or context within which the challenge or concern is located; and, the task upon which CPS will be used" (p. 137).

Vehar, Miller and Firestien (1999) introduced the latest revision of the CPS process. This CPS version depicts the same three components and six stages described earlier; however, the language used to describe CPS was modified to become "easier to learn and use" (p. 91). The

language of the divergent and convergent guidelines was also changed, and a fifth convergent thinking rule was added.

This was a brief history of the development of CPS. The focus now shifts to the validation of creativity education at the State University College at Buffalo.

The Creative Studies Project

The Creative Studies Project (Noller & Parnes, 1972; Parnes & Noller, 1972a, 1972b, 1973) took place from 1969 through 1972 at the State University College at Buffalo. The purpose of this landmark investigation was "to conduct research into the nature and nurture of creative behavior, and to translate the findings into educational programs" (Parnes & Noller, 1972a, p. 12). This research was an extension of the "pilot experimentation and the development of courses, programs, and methods designed to stimulate creative behavior" (p. 14) that took place at the State University of New York at Buffalo from 1949 to 1967.

The research that took place between 1957 and 1967 at the State University of New York at Buffalo dealt with the following four areas:

> (1) the effects of a semester's program in deliberate creativity-stimulation; (2) the relative effects on creative ability of a programmed course used alone or used with instructors and class interaction; (3) the effects of extended effort in creative problem solving; and (4) the effectiveness of the specific creative problem-solving principle of deferred judgment. (Parnes & Noller, 1972a, p. 14)

New hypotheses were established for the research at the State University College at Buffalo, 1969-72, to determine the following:

> students who complete a four-semester sequence of Creative Studies courses will perform significantly better than otherwise comparable students on: (1) tests of creative application of academic subject matter; (2) nonacademic achievement in areas calling for

> creative performance; (3) certain personality factors associated with creativity; and (4) selected tests of mental ability, problem-solving, and job performance. (p. 16)

There were approximately 350 applicants for the Project, of which 150 were randomly selected for the experimental group (i.e., were enrolled in a series of creativity courses), and 150 were placed into a control group (i.e., did not receive any creativity training).

Parnes and Noller (1972b) examined the results of their research through the following questions:

> (1) What differences are found between the personalities of the Experimental subjects (E's) and Control students (C's) at the very beginning of the Project? (2) What differences are there between those students who stay with the Project vs. those who drop out after one or more semesters? (3) What changes associated with creativity occur in the personalities of the students during the two years of the Project? (p. 15)

The results of the project were significant in that it led to the development of undergraduate courses in creative studies. The students who participated in the experimental group exceeded their counterparts in the control group on a variety of psychological measures; specially designed tests given in English courses; increases in personal productivity, creative behavior, and problem solving abilities; and test results in various academic disciplines increased from year-to-year.

These findings from this landmark study, the Creative Studies Project, support the teaching of creativity and the CPS process. The next section focuses on recent research regarding the impact of CPS training, specifically the effectiveness of the six-day graduate CPS course.

More Recent Studies of the Impact of Creative Problem-Solving Training

There has been prior research conducted on the effectiveness of the six-day CPS workshop (i.e. CRS 559 - Principles of Creative Problem Solving) and the impact of the course content on the lives of the participants (Keller-Mathers, 1990; Nielson, 1990). Keller-Mathers (1990) looked at various CPS tools and techniques taught in the graduate level introductory class

and how this knowledge was applied by students in both professional and personal settings. Nielson (1990) investigated the impact of the six-day introductory graduate course on problem-solving behavior.

Keller-Mathers (1990) reported that students found all of the techniques presented in the graduate introductory CPS course to be useful at the end of the course. One year after the course Keller-Mathers found that students reported using seven divergent and convergent tools; however, five CPS tools were not reported to be used one year after the course. Also, 74% of the students reported at least one outcome resulted from the challenges they worked on during the course.

Nielson (1990) collected information from students before and after the graduate introductory CPS course to determine the effectiveness of the methods and techniques taught. Students were asked to comment on their key learnings from the course at its conclusion, including three and six months after. Findings included increased self-confidence, overall approval of the course and practice of techniques learned. Overall, students reported that using the methods and techniques taught improved their personal and professional lives. “These included reports of attaining goals, a feeling of less stress, more control over their lives, and become more open to the people and ideas” (Nielson, 1990, p. 195).

This section described prior research done on the effectiveness of the six-day CPS graduate course on the lives of its participants. The next section discusses the Cognitive Styles Project and its importance to the understanding of the person aspect of creativity.

Cognitive Styles Project

The Center for Studies in Creativity has conducted research in the area of cognitive styles since the mid-1980's (Isaksen, Puccio & Treffinger, 1993). "The goal of this project was to examine the nature of the interactions between preferred ways of processing information and creative problem-solving behavior" (Isaksen et al., p. 153). Rhodes (1961) person, product,

process and press model was cited earlier as a model that has had a great impact on research at the Center for Studies in Creativity. The Cognitive Styles Project tried to explicitly understand the interaction between two strands of Rhodes' (1961) model, specifically person and process.

An early investigation conducted by Zilewicz (1986) examined what strengths and weaknesses people had with different cognitive styles and how they interacted with the CPS process. His investigation used the Gregorc Style Delineator (Gregorc, 1979) to measure cognitive style. Zilewicz (1986) discovered that although students with the same styles reported possessing the same strengths and weaknesses, the individuals with different styles did not have the same strengths and weaknesses.

Puccio (1987) conducted another investigation into cognitive style and creativity. His research focused on fluency and originality variables in relation to creative style. A total of 140 subjects were given both the Kirton Adaption-Innovation (KAI) inventory and selective parts of the Torrance Tests of Creative Thinking (TTCT). The subjects were also asked to generate problem statements based on a problem from the railroad industry. Results of the research indicated that innovators were more fluent and original than adaptors.

Isaksen and Puccio (1988) continued to look at the level-style issue. The purpose of their study "was to examine the relationship between Kirton's measure of creative style and Torrance's measures of creative level" (p. 664). A total of 185 subjects (64 male and 121 female) were involved in the sample; however, only 132 subjects completed both the KAI and TTCT. "Significant correlations were found between the total score and two of the subscales of Kirton's measure (Originality and Rule/Group Conformity) and each of the subtests of Torrance's measure" (p. 666).

Joniak and Isaksen (1988) examined "the relationship between the Gregorc Style Delineator and Kirton's adaptive-innovative distinction" (p. 1043). They were interested in "the relationship between Kirton's adaptive-innovative styles and Gregorc's mediational channels" (p. 1045), as well as the independence and internal consistency of the Gregorc Style Delineator's

subscales. Two samples were tested, and results indicated that the Cronbach alpha's of the KAI were acceptable for both samples. Since the Cronbach alphas were weak for the four Style Delineator's, the reliability of the Gregorc measure was questioned.

Isaksen, Dorval and Kaufmann (1992) investigated "the relationship between imagery and creativity examined using a prediction from the theories of symbolic representation" (p. 271). The purpose of this study, "was to examine the relationship between mode of symbolic representation, as measured by the Individual Differences Questionnaire (IDQ), and preferred mode of problem solving, as measured by the KAI" (p. 272). The measures were given to 154 undergraduate students (43 males and 111 females), enrolled in an introductory course on creativity. Results showed that "subjects with a preference for an innovative cognitive style reported stronger preferences for using conscious symbolic representation than subjects with an adaptive cognitive style" (p. 274). This study, and the four preceding, focused on style and how people carry out certain creative behaviors.

Previous studies (Isaksen, Dorval & Kaufmann, 1992; Isaksen & Puccio, 1988; Joniak & Isaksen, 1988; Puccio, 1987; Zilewicz, 1986) investigated relationships between cognitive style and creativity, specifically the creative person. Hurley's (1993) investigation was the first to link problem-solving style to preferences for using CPS tools. Specifically, this research validated KAI styles and its relationship to CPS. Results indicated that both adaptors and innovators had style differences in their use of CPS techniques after training. The adaptors enjoyed the pluses, potentials and concerns, and idea systems; whereas innovators favored highlighting, forced relationships, visual connections and mental imagery. The investigation completed by Hurley (1993) is valuable in helping us to understand the relationship between an individual's problem-solving style preference and use of CPS techniques.

This section discussed prior research conducted by the Center for Studies in Creativity in the area of cognitive styles. The next section addresses the significance of this research study and how it is an extension of cognitive styles research.

Significance of the Present Study

This study is an extension of the previous work done in relation to cognitive styles. Specifically, this study focused on the impact of CPS training, as assessed through individuals' problem-solving preferences (Puccio, 1999). Historically, the Kirton Adaption-Innovation Inventory (KAI) has been used to understand the relationship between CPS behavior and cognitive style (Hurley, 1993; Isaksen, Dorval & Kaufmann, 1992; Isaksen & Puccio, 1988; Joniak & Isaksen, 1988; Puccio, 1987). Hurley's (1993) investigation was the first to look at how individuals interact with the CPS process using a general problem-solving style assessment tool (i.e., the KAI). The importance of the present study is to validate specific preferences for the CPS process using a measure designed for this purpose, the Buffalo Creative Process Inventory (BCPI; Puccio, 1999), versus a measure that indicates general preferences for problem solving.

The current investigation builds on Hurley's (1993) study and serves to extend the Cognitive Styles Project. This investigation used the BCPI to assess the relationship between problem-solving style preferences and the CPS process. The BCPI, unlike the KAI, was designed specifically to measure preferences in regard to CPS. Thus, the present study departs significantly from past research because it examined the impact of CPS through the lens of a style measure designed specifically to assess CPS preferences. The research will be valuable to both teaching and training individuals in the CPS model, as well as future CPS research. It is believed that this research will lead to a deeper understanding of the dynamics of the CPS process and tools (i.e., uses in small group facilitation, classrooms, personal use, etc.), by helping us to understand how different styles influence the way in which people learn and use CPS.

This section described the significance of the current research study and its relation to the cognitive styles research conducted by the Center for Studies in Creativity. The next section describes the specific questions that guided this study.

Thesis Questions

The first goal of this study was to investigate the relationship between people's style and the degree to which they enjoyed learning the various components, stages and tools of the CPS process. This goal examined whether individuals' BCPI preferences was related to the degree to which they enjoyed learning certain aspects of CPS. For example, as an individual learns the CPS process, the person may engage him/herself more or less at various stages in the process and thus it will be interesting to learn whether people enjoy learning what already comes naturally to them or whether they will enjoy what does not fit their natural inclinations. The next goal was designed to understand which components, stages and tools students believed would be most valuable to them in the future. This would uncover any similarities and/or differences between what the student enjoyed learning during the course and the application of the CPS process and tools beyond the classroom. Again, the researcher was also interested in learning whether participants believed the most useful aspects of the course related to what they already naturally did by preference or if what was perceived to be most valuable compensated for aspects of CPS that did not reflect the student's natural preferences.

This study collected both quantitative and qualitative data to investigate the relationship between BCPI and the impact of CPS training. This study sought to find theoretically expected differences in terms of the impact of a CPS course in relation to style preferences.

Since this research study was the first of its kind in relation to the BCPI, no hypotheses were established. The intent of this research was "exploratory" and its findings would set precedence for future studies. Designating the research as exploratory also allowed for a variety of outcomes to flourish versus answering tentative assumptions at this early stage in the existence of the BCPI.

The specific questions that guided this study were as follows:

- To what degree did students enjoy learning the various components, stages and tools of the CPS process?
- Which components, stages and tools do students believe will be of most value to them in the future?
- What were the relationships between students reported enjoyment and perceived value of the CPS training, and their CPS styles as measured by the BCPI?

Conclusion

This chapter reviewed the historical development of CPS and its impact on the lives of those who have learned the process; and the Creative Studies and Cognitive Styles Projects were explored. It examined the significance of this research and the questions that guided this thesis.

The next chapter reviews the literature related to Kirkpatrick's evaluation methodology and its use in this study. Literature pertaining to cognitive styles, specifically the Kirton Adaption-Innovation Inventory and the Myers-Briggs Type Indicator. The chapter then focuses on the BCPI and its development. It concludes with an analysis of previous studies this thesis is based.

Chapter Two: Review of Related Literature

Introduction

The purpose of this chapter is to review pertinent literature in relation to this thesis. Specifically, this chapter reviews Kirkpatrick's evaluation methodology and its use in this study. Literature pertaining to cognitive styles, specifically the Myers-Briggs Type Indicator and the Kirton Adaption-Innovation Inventory is reviewed. The chapter then focuses on the BCPI and its development. It concludes with an analysis of previous studies this thesis is based on, a chapter summary and a preview of Chapter Three.

Training Evaluation Methodology

Due to the nature of the present study, it is important to understand the theoretical framework for which this research is modeled after. This framework is known as the "Four-Level Model for Evaluation" (Kirkpatrick, 1994, 1996; Lawson, 1998; Phillips, 1999a, 1999b, 1999c, 1999d). "The most widely known model for evaluating training programs was introduced by Donald Kirkpatrick in 1959 and is regarded as a classic by training practitioners" (Lawson, 1998, p. 203). The four levels of evaluation are known as: Level One, Reaction; Level Two, Learning; Level Three, Behavior; and Level Four, Results. All four levels are defined, but only Level One is covered in depth as it is related to this thesis.

Level Two, or learning, "can be defined as the extent to which participants change attitudes, improve knowledge, and/or increase skill as a result of attending a training program" (Kirkpatrick, 1994, p. 22). Level Three, or behavior, "can be defined as the extent to which change in behavior has occurred because the participant attended the training program"

(Kirkpatrick, 1994, p. 22). Level Four, or results, can be defined as the results that occurred because the participants attended the program" (Kirkpatrick, 1994, p. 25).

Level One, or reaction, is how those who partake in the program react to it (Kirkpatrick, 1994, 1996). "Evaluating reaction is the same thing as measuring customer satisfaction" (Kirkpatrick, 1994, p. 24). Level One focuses on "how well the trainees liked a particular training program…evaluating in terms of reaction is the same as measuring the feelings of the conferees" (Kirkpatrick, 1996, p. 295). It is noted that in Level One no measurement of learning or analysis of change in an individual's attitude or increased skill level is investigated.

The following guidelines were established to measure reaction according to Kirkpatrick (1996):

> (1) Determine what you want to find out; (2) Use a written comment sheet covering those items determined in step one; (3) Design the form so that the reactions can be tabulated and quantified; (4) Obtain honest reactions by making the forms anonymous; and (5) Encourage the conferees to write in additional comments not covered by the questions that were designed to be tabulated and quantified. (p. 296)

Additional guidelines include obtaining a 100% immediate response; developing acceptable standards; measure against established standards and take necessary action; and communicate reactions as deemed appropriate (Kirkpatrick, 1994).

Since a theoretical framework for evaluating training has been established, the focus shifts to relating type and style to creativity. Specifically, the next section investigates both the Myers-Briggs Type Indicator and the Kirton Adaption-Inventory.

Relating Type and Style to Creativity

To understand the selection of the assessment tool used in this study (i.e., the Buffalo Creative Process Inventory), it is important to review assessment tools used in the past (i.e., the Myers-Briggs Type Indicator and the Kirton Adaption-Innovation Inventory) to relate type and

style to creativity. This section examines the Myers-Briggs Type Indicator, used to determine an individual's psychological type; and the Kirton Adaption-Innovation Inventory, used to ascertain a person's style, or preference for solving problems in general.

The history of the Myers-Briggs Type Indicator (MBTI) dates back to the psychological type theory of Carl G. Jung in the early 1920's (Myers, McCaulley, Quenk, & Hammer, 1998; Pittenger, 1993). "Jung viewed individual development as a lifelong process…he believed human beings have an innate urge toward growth and have within themselves everything they need to become effective healthy people" (Myers & Kirby, 1994, p. 21). It was the goal of Jung "to explain individual differences in personality initially stemmed from his observation that there were two types of people, *extraverts* and *introverts*" (Myers et al., 1998, p. 22).

Approximately ten years after his initial studies of extraversion and introversion, Jung noted that the aforementioned types did not provide a complete picture of what he observed in people. "Jung subdivided his initial extravert and introvert types into eight types by identifying two pairs of opposite mental functions: two opposite perceiving functions, *sensation* versus *intuition*; and two opposite judging functions, *thinking* versus *feeling*" (Myers et al., 1998, p. 22). He further defined which of the two types, extraversion and introversion, would be habitually used by someone as a dominant function. "The term dominant function refers to the function – Sensing, Intuition, Thinking, or Feeling – that is likely to be used most enthusiastically, most often, and with greatest confidence…the dominant function can be viewed as directing, or 'dominating,' the personality" (Myers et al., 1998, p. 22).

The development of the MBTI did not take place until 1942 (Myers et al., 1998). The MBTI is designed "with the belief that different vocations favored different personality orientations and that Jung's theory provided the theoretical structure to link personality and job performance" (Pittenger, 1993, p. 468). In 1975, Consulting Psychologists Press acquired the right to sell and distribute the MBTI, thus creating a proprietary instrument. "Today the MBTI is

the most widely used personality instrument in the world – 2 million administrations are given each year" (Myers et al., 1998, p. 9).

The MBTI was designed with two goals: "(1) the identification of basic preferences on each of the four dichotomies specified or implicit to Jung's theory; and (2) the identification and description of the 16 distinctive personality types that result from interactions among the preferences" (Myers et al., 1998, p. 4). "The MBTI instrument identifies four separate dichotomies: Extraversion versus Introversion, Sensing versus Intuition, Thinking versus Feeling, and Judging versus Perceiving" (p. 6). Myers et al. (1998) characterizes how the 16 MBTI types evolve:

> According to theory, each of the 16 types results from a preference for one pole of each of the four dichotomies over the opposite pole. A preference on any one dichotomy is designed to be psychometrically independent of the preferences on the other three dichotomies. Therefore, preferences on the four dichotomies yield 16 possible combinations called types, which are denoted by the four letters identifying the poles preferred (e.g., ESTJ, INFP). (p. 6)

With regard to type theory, people may reasonably be expected to develop greater comfort and ability with the processes they prefer to use and with the attitudes in which they prefer to use them.

There have been a number of studies conducted indicating links between the MBTI and creativity (Fleenor & Taylor, 1994; Forsgren, 1990; Gryskiewicz & Tullar, 1995; Tegano, 1990). In order to understand the relationship between creativity and type, the MBTI Creativity Index (MBTI-CI) was established. The MBTI-CI is calculated as follows: "MBTI Creativity Index = 3SN + JP – EI - .5TF" (Myers et al., 1998). Many of the studies that follow include the MBTI-CI in its research.

Fleenor and Taylor (1994) examined relationships among three measures: the California Psychological Inventory and its Creativity Scale (CPI-CT); the MBTI and its Creativity Index

(MBTI-CI); and the KAI, to measure a person's creativity style. Significant correlations were discovered among the three measures, and KAI scores did relate to creativity levels as reported on the CPI-CT and MBTI-CI.

Forsgren (1990) investigated the correlation between psychological type preferences (as measured by the MBTI) and individuals who identified themselves as inventors. Results indicated that both INTP's and ISTP's are significantly over-represented in the inventor group and that these two types display behaviors, which are consistent with type preferences.

Gryskiewicz and Tullar (1995) examined scores reported on both the MBTI and KAI of U.S. corporate managers. The outcome of this research indicated that an individual who held a position in middle management tended to be innovative, and there is a correlation between the KAI and MBTI dimensions of sensing-intuition (S-N), and judging-perceiving (J-P).

Tegano (1990) utilized the MBTI and its Creativity Index (MBTI-CI), the AT-20 and the Adult Behavior Inventory of Playfulness to assess correlations for playfulness, tolerance for ambiguity and creativity. Results from this research indicated that the three factors do significantly interact. Pearson product-moment correlations confirmed that both the Adult Behavior Inventory (playfulness) and the AT-20 (tolerance of ambiguity) were related to scores reported on the MBTI-CI. "The creativity Index was correlated with scores on playfulness related ($r = .48$, $p<.001$) and on tolerance of ambiguity ($r = .31$, $p<.01$)…scores on playfulness were significantly related to those on tolerance of ambiguity ($r = .81$, $p<.001$)" (Tegano, 1990, p. 1053).

In addition to the MBTI, the Kirton Adaption-Innovation Inventory has been studied to determine connections between creativity and style.

The Kirton Adaption-Innovation (KAI) was developed by Michael Kirton, a British researcher, in 1976 (Kirton, 1987, 1999). "The Adaption-Innovation Theory is one of Cognitive Style that embraces problem solving, decision making and creativity as very closely interrelated concepts or even facets of the same concept" (Kirton, 1987, p. 8). "In locating this theory as one

of style ('what manner') it is specifically separated from what is assumed to be orthogonally related concept of cognitive capacity ('how much')" (Kirton, 1987, p. 8). Kirton (1987) described the KAI instrument as:

> The Kirton Adaption-Innovation Inventory (the measure of the theory) yields a continuum of scores on which no location is either praiseworthy or pejorative. A person with any score will hold and, for the most part, exhibit a preferred range of characteristics which individually can be perceived or rated as advantageous or disadvantageous, depending on: (a) the perceiver or rater; (b) the nature of the problem; (c) the nature of the setting, institutional group or other individual, or, by hindsight; or (d) the outcome. (p. 8)

The implications of these assumptions are that adaption-innovation theory has significance for further understanding of an individual's preferred way of solving problems, as an individual alone or as a member of a group or team.

To understand adaption-innovation theory, one must investigate the behavior and differences between adaptors and innovators. An adaptor is someone who is:

> characterized by precision, reliability, efficiency, methodicalness, prudence, discipline, conformity…concerned with resolving problems rather than finding them…seeks solutions to problems in tried and understood ways…seen as sound, conforming, safe, dependable…is an authority in given structures…*when collaborating with innovators*: supplies stability, order and continuity to the partnership…and provides a safe base for the innovator's riskier operations (Kirton, 1999, p. 122).

In contrast to an adaptor, an innovator is viewed as:

> seen as undisciplined, thinking tangentially, approaching tasks from unsuspected angles…could be said to discover problems and discover avenues of solution…queries problems' concomitant assumptions; manipulates problems…tends to take control in unstructured situations…*when collaborating with adaptors*: supplies the task

> orientations, the break with the past and accepted theory…and provides the dynamics to bring about periodic radical change, without which institutions tend to ossify (Kirton, 1999, p. 122).

Isaksen et al. (1994) highlighted the fact that "it is important to remember that there is no good or bad, right or wrong style of creativity…each style has its own potential strengths and limitations" (p. 91).

In order to determine an individual's preference for either the adaptor or innovator styles, the KAI includes three unique sub-scales which are originality, efficiency and rule conformity (Isaksen et al., 1994; Kirton, 1987, 1999). Originality, the first KAI sub-scale, indicates that adaptors prefer to generate a sufficient quantity of new ideas, but not an abundance of them. Their ideas are quite likely to be viewed as useful and relevant to the situation at hand. Innovators, on the other hand, prefer a profusion or proliferation of original ideas, seeking to generate as many as possible. Their ideas are less likely to be accepted immediately, and more likely to challenge the way the problem was defined to begin with.

The next KAI sub-scale is efficiency and is defined as ones preference for detail, precision, and thoroughness (Isaksen et al., 1994; Kirton, 1987, 1999). The adaptor prefers to be thorough and to pay attention to the details and fine points when handling tasks. The innovator prefers to deal with the task in a broader, more spontaneous manner, and to be less concerned with the details and often obviously bored with the situation.

The last KAI sub-scale is rule or group conformity, deals with your preference for working within established rules, guidelines, or systems (Isaksen et al., 1994; Kirton, 1987, 1999). The adaptor places greater emphasis on conforming to the established procedures or ways of doing things. The innovator is more likely to emphasize the importance of unique pathways, and less likely to feel constrained by rules, pressures toward conformity or consensus. Isaksen et al. (1994) noted "your overall style – as an adaptor or an innovator – represents the composite of your preferences in these three areas" (p. 92).

Since the KAI and its sub-scales have been described, let's turn to studies in which the KAI was used to understand problem-solving behaviors (i.e., Blissett & McGrath, 1996; Gelade, 1995; Hammerschmidt, 1996; Hurley, 1993; Isaksen & Puccio, 1988; Pershyn, 1992; Puccio, 1987, 1999; Torrance & yun Horng, 1980). Each of the aforementioned studies are briefly covered in this chapter.

Blissett and McGrath (1996) investigated whether interpersonal problem-solving and creativity training reflect equivalent or complementary skills in adults. Four measures were used: Means-Ends Problem Solving, Torrance Test of Creative Thinking – Verbal, The Problem Solving Inventory and the KAI. Results underscored the position that both creativity and interpersonal problem-solving training are two related but independent skills that influence one another.

Gelade (1995) examined KAI scores with divergent production scores on the Consequences Test of British workers. With regard to Consequences Test, both adaptors and innovators produced approximately an equal amount of common responses, but innovators produced an increased amount of uncommon, or unusual responses. These findings suggest that adaptors and innovators differ on some dimensions of creative ability, while other dimensions remain consistently equal.

Hammerschmidt (1996) conducted a four-year study tracking the problem-solving success rates of managers, who were arranged in teams by their KAI scores. It was discovered that teams were highly successful at assigned tasks that were dependent on the groups' preferred KAI style; and when groups were assigned tasks opposite of their preferred KAI style, their success rates were lower. "The results indicate that people do approach, solve, and communicate problems with different styles, and that these various style combinations do influence success rates due to cognitive gap and role preference" (Hammerschmidt, 1996, p 73).

Hurley (1993) investigated links between KAI styles and preferences for using CPS tools. Results indicated that both adaptors and innovators had style differences in their use of CPS

techniques after classroom training. The adaptors enjoyed predominately convergent thinking tools, while innovators mostly divergent thinking tools.

Isaksen and Puccio (1988) investigated the relationship between KAI and the Torrance Tests of Creative Thinking (TTCT). "The purpose of this study was to reexamine Kirton's claim that his measure of creative style is discrete and orthogonal to measures of creative level" (p. 667). Results yielded significant correlations between the KAI total score and subtests of the TTCT, specifically Fluency, Flexibility and Originality. The strongest correlations were produced with the KAI's Rule/Group Conformity subscale and the TTCT's Fluency, Flexibility and Originality subtests, and also the KAI's Originality subscale and the TTCT's Flexibility and Originality subtests. These results indicate there are some relationships between the two measures.

Pershyn (1992) examined the relationship between KAI styles and depictions of an individual's creative process. Participants were asked to illustrate how one solves problems, as well as being administered the KAI. Results concluded that adaptors had more of a linear style of problem-solving, or preferred to solve problems in a step-by-step manner; whereas innovators used both linear and non-linear approaches to problem solving. It was also discovered that both adaptors and innovators utilized a wide range of graphic elements to depict personal problem-solving processes, and that this had no relationship to their style of creativity.

Puccio (1987) conducted an investigation into cognitive style and creativity, using both the KAI and the Torrance Tests of Creative Thinking (TTCT). The goal of this research was to examine an individual's problem defining behavior based on their style of creativity, based on the KAI. Results of the research indicated that innovators were more fluent and original than adaptors. It was also concluded that fluency, not style, had a significant effect on originality.

Torrance and yun Horng (1980) examined the KAI and ten other creativity related tests to determine if adaption-innovation theory supported adaptors and innovators being equally creative. "The present study was designed to explore possible ways in which adaptors and

innovators might differ on a wider range of creative thinking tests and tests of creative motivation and style of learning and thinking" (p. 81). Results indicated that only four measures (Possible Jobs, Seeing Problems, Similes Originality measure and the TTCT Elaboration measure) were related to adaption-innovation theory suggesting adaptors and innovators are equally creative.

Puccio (1999) investigated the relationship between a person's reported problem-solving style and preference for different stages of the CPS process. Subjects were given the Buffalo Creative Process Inventory (BCPI), the Creative Problem Solving Profile (CPSP) and the KAI. Analysis yielded seven significant correlations between the KAI and the BCPI. "The only one significant correlation that emerged between the KAI total score and the BCPI preferences was found for Ideator and Kirton's innovator style ($r=.44$, $p < .001$)" (Puccio, 1999, p. 176). The other correlations were as follows: BCPI Ideator and KAI subscale Sufficiency of Originality ($r=.76$, $p < .001$); BCPI Collector and KAI subscale Sufficiency of Originality ($r=.37$, $p < .01$); BCPI Executor and KAI subscale Sufficiency of Originality ($r=.40$, $p < .01$); BCPI Clarifer and KAI subscale Rule/Group Conformity ($r= -.29$, $p < .05$); and BCPI Developer and KAI subscale Efficiency ($r= -.32$, $p < .05$) and Rule/Group Conformity ($r= -.27$, $p < .05$).

This section reviewed the MBTI and KAI instruments. Various research studies were examined for relationships between the aforementioned assessment measures and their use in understanding creativity. The research conducted by Puccio (1999) was most significant to the present study due to the foundational research of the BCPI. The next section explores the theory the BCPI and its relation to the CPS process model.

An Overview of the Buffalo Creative Process Inventory

The BCPI is a thirty-question measure "designed to identify preferences in terms of the major operations within Creative Problem Solving" (Puccio, 1999, p. 171). The theory the BCPI is derived from is based on the belief that an individual's creative process is made up of a predetermined sequence of mental operations for solving problems. Puccio suggested that these

mental operations can be described, and that a person's creative process occurs naturally. Since people possess preferences for different mental processes, or cognitive styles, people should possess different preferences for the mental operations associated with the CPS process.

> The BCPI was designed to:
>
> help people become aware of their Creative Problem-Solving preferences so that they can better understand their strengths and weaknesses when solving problems creatively. This knowledge may help people to more skillfully solve open-ended problems by recognizing their natural tendencies and skills, and to use Creative Problem-Solving strategies to strengthen less-developed skills (Puccio, 1999, p. 172).

Based on the aforementioned statement, the BCPI was developed to identify a person's preferences for the six stages of the CPS process (Isaksen et al., 1994; Puccio, 1999; Vehar, Firestien & Miller, 1999). "The BCPI is based on descriptive statements of activities associated with each stage of the Creative Problem-Solving model" (Puccio, 1999, p. 173). Puccio further stated "the BCPI requires that respondents consider how descriptive various creative problem-solving activities are of them" (p. 173).

This measure reports four different problem-solving preferences in relation to the CPS process. The first preference of the BCPI is 'Clarifer,' which is associated with the CPS process stages of Gather Data and Clarify the Problem. The second BCPI preference is 'Ideator,' which is associated with the CPS stages of Identify Goal, Wish or Challenge and Generate Ideas. The next BCPI preference is 'Developer,' which correlates with the CPS stage Select & Strengthen Solutions. The final BCPI preference is 'Implementer,' which associates with the CPS stage Plan for Action.

Each of the above listed BCPI preferences (i.e. Clarifier, Ideator, Developer, Implementer) identifies the strengths of an individual's problem-solving style. A 'Clarifier' is someone who likes to explore the problem; has a clear understanding of the problem before him or herself; and can become over cautious about moving forward with the problem. An 'Ideator'

is someone who looks at the entire picture first; will stretch his/her imagination; and may take an intuitive approach, or "hunch" instinct, to solving problems. A 'Developer' enjoys the examination of the pluses and minuses of an idea; will take pleasure from thinking of and planning the steps for implementing an idea; and may get "caught up" in the development of the perfect solution to the problem. Last, an 'Implementer' wants to see action; will focus on the ideas and solutions that one feels will work; and may take action too hastily.

Conclusion

This chapter reviewed Kirkpatrick's evaluation methodology and its use in this study. Literature pertaining to cognitive styles, specifically the Myers-Briggs Type Indicator and the Kirton Adaption-Innovation Inventory. The chapter focused on the BCPI and its development, and concluded with an analysis of previous studies this thesis is based upon.

The next chapter will outline the methods and procedures by which this study was conducted.

Chapter Three: Methods and Procedures for Conducting the Study

Introduction

The purpose of this chapter is to outline the methods and procedures by which this study was conducted. Specifically, this chapter provides general characteristics of the research participants and why the participants were chosen. Next, a description of the two measures used for data collection are described (i.e., the Buffalo Creative Process Inventory (BCPI) and the Creative Problem Solving Course Survey (CPSCS)). The chapter then focuses on the procedures used to administer the BCPI and the CPSCS to participants. It concludes with a chapter summary and a preview of Chapter Four.

Participants of this Study

The participants for this study were both graduate and undergraduate students enrolled in introductory Creative Problem Solving courses at the State University College at Buffalo. The participants were 73 graduate and 11 undergraduate students. These participants were in enrolled in four sections of the graduate course CRS 559 – Principles in Creative Problem Solving, and one section of the undergraduate course CRS 302 – Creative Approaches to Problem Solving. These courses were taught in the spring, summer and fall semesters of the year 2000.

A Description of the Buffalo Creative Process Inventory

The BCPI is a thirty-item measure "designed to identify preferences in terms of the major operations within Creative Problem Solving" (Puccio, 1999, p. 171). The theory of the BCPI is based upon an individual's creative process, which is made up of a predetermined sequence of

mental operations of solving problems (Puccio, 2000). It is said that these mental operations can be depicted, and that a person's creative process occurs naturally. Furthermore, people possess preferences for different cognitive styles, or ways of processing information. Based on these assertions, Puccio (2000) suggested that people should possess different preferences for the mental operations associated with the CPS process.

This measure reports four different problem-solving preferences in relation to the CPS process. The first style of the BCPI is 'Clarifer,' which is associated with the CPS process stages of Gather Data and Clarify the Problem. The second BCPI style is 'Ideator,' which is associated with the CPS stages of Identify Goal, Wish or Challenge and Generate Ideas. The next BCPI style is 'Developer,' which correlates with the CPS stage Select & Strengthen Solutions. The final BCPI style is 'Implementer,' which associates with the CPS stage Plan for Action.

"The BCPI is based on descriptive statements of activities associated with each stage of the Creative Problem Solving model" (Puccio, 1999, p. 173). These items were originally created to mirror distinct activities in relation to the six stages of the CPS process (i.e., Identify Goal, Wish or Challenge; Gather Data; Clarify the Problem; Generate Ideas; Select & Strengthen Solutions; Plan for Action), and taking into consideration the purpose of each of the aforementioned stages.

A factor analysis was conducted to ascertain if the theoretical structure of the measure would emerge, specifically the six stages of the CPS process. "Principal components analysis was used with varimax rotation to extract discrete factors…this analysis yielded 12 factors" (Puccio, 1999, p. 174). Of the 12 factors, six were identified as follows: Factor One, Ideator; Factor Two, Developer; Factor Three, Executor (now referred to as Implementer); Factor Four, Collector; Factor Five (unnamed); and Factor Six, Clarifier. For each of these factors, only items that loaded < .30 were included. The percentage of variance ranged from 29 to 52%. The Chronbach Alpha's ranged from .70 to .90 for factors one through four, and six.

A Description of the Creative Problem Solving Course Survey

The CPSCS was designed for administration at the conclusion of an introductory CPS course. Its purpose was to investigate the degree to which students enjoyed learning the CPS process, as well as their beliefs with regard to how useful this material will be in the future (i.e. personal and professional lives). This survey contained three distinctive parts: Parts One and Two focused on the 'rank order,' or the prioritization of CPS principles, components, stages and tools taught by the course instructor of which the student preferred the most to least; and Part Three contained three open-ended questions.

Part One of the survey was designed to assess the enjoyment of learning the CPS components, principles, stages and tools. The goal of Part One was to ascertain which of the pieces of the CPS process the student took pleasure from in learning. Part Two focused on the future value of the component, principle, stage and tool in the student's daily activities. Part Two's goal was to determine how the student would use the process in the future. Part Three was designed with three open-ended questions to gather information based on (1) the student's most significant learning from this course and why; (2) how will the student *personally* benefit from this course; and (3) how will the student *professionally* benefit from this course. These open-ended questions were included to gain a deeper understanding of the perceptions the student gained from taking the course and its impact on his/her life.

Methodology

The BCPI was administered in the beginning of the semester in each course before students had an opportunity to learn CPS. This was done in order to gain a perspective on how students felt about solving problems creatively prior to learning the CPS process. It was felt that if the process was learned preceding the administration of the BCPI, then the students' scores would be influenced by the information they were taught.

Once the BCPI was administered, the instrument was then debriefed during a later class meeting. The debrief contained information on the history, theory and descriptions of the four preferences of the instrument. At the conclusion of the debrief session, students received written feedback of their preferences. Questions from the students were answered as well.

At the conclusion of each course, the CPSCS was administered. Students were given a Consent Form, as required by the State University of New York Research Foundation, to grant permission to use the information gathered by the CPSCS and the BCPI in this research. Once students completed the survey, the information reported on the CPSCS was correlated with the styles reported by the BCPI.

Conclusion

This chapter reviewed the methods and procedures by which this study was conducted. A description of the participants was given, and an overview of the BCPI and CPSCS was explained. Lastly, the means by which the BCPI and CPSCS were administered was explored.

The next chapter presents the findings and an analysis of the data gathered by this study.

Chapter Four: Presentation and Analysis of Data

Introduction

The purpose of this chapter is to present the findings and the analysis of the data gathered for this study. Quantitative and qualitative data is presented. Descriptive data organized by BCPI preference results are reported first, then the remaining data is organized in two sections by the enjoyment of learning and then the future value of using Creative Problem Solving components, principles, stages and techniques. Qualitative data is presented last. The chapter concludes with a summary and a preview of Chapter Five.

General Quantitative Results for the Buffalo Creative Process Inventory

This section outlines the general quantitative results for the BCPI in this study and describes the calculations performed for the four preferences (i.e., Clarifier, Ideator, Developer and Implementer).

Table 4.1

Mean and Standard Deviation

for the Buffalo Creative Process Inventory Preferences

Variable	Mean	Std. Dev.	Minimum	Maximum	N
Clarifier	3.57	.68	2.11	5.00	84
Ideator	3.62	.70	2.11	5.00	84
Developer	3.41	.73	1.78	4.86	84
Implementer	3.66	.72	1.78	5.00	84

Table 4.1 outlines the mean and standard deviation calculations for the four preferences of the Buffalo Creative Process Inventory (BCPI). A total of 84 subjects were administered the BCPI. There are four BCPI preferences (i.e., Clarifier, Ideator, Developer and Implementer). Of these four preferences, the Developer preference had the lowest mean of 3.41 (n = 84), with Implementer having the highest mean of 3.66 (n = 84). No subject received a preference score lower than 1.78 (i.e., Developer and Implementer), although an individual can score below the aforementioned figure (Puccio, 2000).

Table 4.2 portrays the number of subjects with an overall highest and lowest score for each of the four BCPI preferences and percentages with respect to the total sample. This was determined by examining which of the four BCPI preferences were highest and lowest from an individuals overall BCPI style (i.e., the combination of the four BCPI preferences). Excluded from these totals are individuals who had two or more identical scores for the four BCPI styles. Percentages reflect the number of individuals organized into the categories divided by the total number in this study (n = 84). For the overall highest BCPI preference, 'Implementer' was most reported at n = 31, or 37%; whereas 'Developer' was least reported at n = 7, or 8%. For the overall lowest BCPI preference, 'Developer' was reported most at n = 22, or 26%; and 'Ideator' was least reported at n = 15, or 18%.

Table 4.2

Overall Highest and Lowest Preference Totals and Percentages

for the Four Styles of the Buffalo Creative Process Inventory

Variable	High Pref. Total	%	Low Pref. Total	%	N
Clarifier	19	23	17	20	84
Ideator	21	25	15	18	84
Developer	7	8	22	26	84
Implementer	31	37	19	23	84

Table 4.3 outlines the number of individuals who were categorized into groups based on their high and low scores for the four BCPI preferences. This classification was achieved by dividing the standard deviation of the BCPI preferences in Table 4.1 in half. Then either adding or subtracting this amount from the BCPI preference mean. For example, a 'Developer' has a mean of 3.41 and a standard deviation of .73, which half of this is .36. When .36 is added to the mean for a Developer, this total is 3.77; and when subtracted the total is 3.05. Therefore individuals who scored higher than 3.77 are 'High Developers' and below the total of 3.05 are considered 'Low Developers.' Scores that were not categorized high or low were not calculated for parts of this analysis. Percentages below reflect the number of individuals organized into the categories divided by the total number in this study (n = 84).

Both Developer (n = 25, or 30%) and Implementer (n = 25, or 30%) had the fewest number of individuals reporting scores higher than the adjusted means of 3.97 and 4.02, and respectively. Clarifier (n = 30, or 36%) and Ideator (n = 30, or 36%) tied for the largest number of individuals reporting scores higher than their adjusted means of 3.77 and 3.91, respectively. Implementer (n = 24, or 29%) scored the fewest for individuals with low preference; and Ideator (n = 31, or 37%) scored the largest number of individuals with a low preference.

Table 4.3

Adjusted Means, High and Low Preference Groups and Percentages for the Four Styles of the Buffalo Creative Process Inventory

Variable	Mean > or =	High Pref. Group	%	Mean < or =	Low Pref. Group	%	N
Clarifier	3.77	30	36	3.05	27	32	84
Ideator	3.91	30	36	3.23	31	37	84
Developer	3.97	25	30	3.27	25	30	84
Implementer	4.02	25	30	3.30	24	29	84

This section outlined the general quantitative results for the BCPI in this study and described the calculations performed for the four individual preferences. The next section focuses on the quantitative results for the enjoyment of learning Creative Problem Solving components, stages, principles and tools.

Quantitative Results for the Enjoyment of Learning Creative Problem Solving Components, Stages, Principles and Tools

This section describes the quantitative results and calculations for the enjoyment of learning Creative Problem Solving components, stages, principles and tools. These results were obtained from Part One of the Creative Problem Solving Course Survey (CPSCS), which is described in Appendices I and J. With respect to the two versions of the CPSCS, it is important to note that two versions of the CPS model were used in the various classes (i.e., Isaksen, Dorval & Treffinger, 1994; Vehar, Firestien & Miller, 1999). To avoid confusion the CPS language used in the analysis relates to Vehar et al. (1999).

Table 4.4 displays the mean and standard deviations for the enjoyment of learning CPS components. Individuals were asked to rank order the CPS components from one through three in Section I-A of the CPSCS. The minimum and maximum listed reflect the rank order 'most enjoyed' and 'least enjoyed,' respectively.

'Generating Ideas' had the lowest mean, 1.50 and a standard deviation of .75. 'Planning for Action' garnered the highest mean of 2.38 and a standard deviation of .69. All 84 participants responded to rank ordered these options.

Table 4.5 outlines the mean and standard deviation for the enjoyment of learning CPS principles. These results derive from the list of CPS principles participants were asked to rank order from 'most enjoyed' (i.e., one) to 'least enjoyed' (i.e., twelve) in Section I-B of the CPSCS. The principles were categorized beginning with Dynamic Balance, then the Divergent

Table 4.4

Mean and Standard Deviation

for the Enjoyment of Learning Creative Problem Solving Components

Variable	Mean	Rank	Std. Dev.	Minimum	Maximum	N
Explore the Challenge	2.12	2	.75	1.00	3.00	84
Generating Ideas	1.50	1	.75	1.00	3.00	84
Planning for Action	2.38	3	.69	1.00	3.00	84

Table 4.5

Mean and Standard Deviation

for the Enjoyment of Learning Creative Problem Solving Principles

Variable	Mean	Rank	Std. Dev.	Minimum	Maximum	N
Dynamic Balance	6.13	6	3.46	1.00	12.00	83
Divergent Thinking	3.86	2	2.97	1.00	12.00	84
Defer Judgment	3.56	1	2.65	1.00	11.00	70
Strive for Quantity	5.63	4	2.79	1.00	12.00	84
Seeking Wild & Unusual Ideas	4.59	3	3.22	1.00	12.00	83
Building Ideas	5.77	5	2.46	1.00	12.00	84
Convergent Thinking	7.03	8	2.90	1.00	12.00	76
Be Affirmative	7.20	9	2.84	1.00	12.00	84
Be Deliberate	8.63	12	2.67	1.00	12.00	84
Check Your Objectives	8.36	11	3.15	1.00	12.00	84
Improve Ideas	7.44	10	2.96	1.00	12.00	62
Consider Novelty	6.60	7	3.29	1.00	12.00	84

and Convergent Thinking guidelines. Due to differences in instruction from the five sections of CRS 559 and CRS 302, not all participants responded because either the principle was not covered or the individual was absent from class the day it was taught.

The CPS principle 'Defer Judgment' was the most enjoyed principle, with a mean of 3.56, a standard deviation of 2.65 and n = 70. The minimum was 1.00 and maximum of 11.00, in which no person rank ordered the principle as least enjoyable to learn. 'Be Deliberate' was the least enjoyed principle, which had a mean of 8.63, standard deviation of 2.67 and n = 84. It had a minimum of 1.00 and maximum of 12.00.

Table 4.6

Mean and Standard Deviation

for the Enjoyment of Learning Creative Problem Solving Stages

Variable	Mean	Rank	Std. Dev.	Minimum	Maximum	N
Identify Goal, Wish or Challenge	3.39	3	1.66	1.00	6.00	84
Gather Data	3.61	4	1.46	1.00	6.00	84
Clarify Problems	3.01	2	1.70	1.00	6.00	84
Generate Ideas	2.46	1	1.69	1.00	6.00	84
Select & Strengthen Solutions	3.88	5	1.54	1.00	6.00	84
Plan for Action	4.58	6	1.42	1.00	6.00	84

Table 4.6 outlines the mean and standard deviation for the enjoyment of learning CPS stages. Section II of the CPSCS asked participants to rank order CPS stages from one (most enjoyed) through six (least enjoyed). 'Generate Ideas' was most enjoyed, which had a mean of 2.46, a standard deviation of 1.69 and n = 84. 'Plan for Action' was least enjoyed, which had a mean of 4.58, standard deviation of 1.42 and n = 84.

Table 4.7

Mean and Standard Deviation

for the Enjoyment of Learning Creative Problem Solving Tools

Variable	Mean	Rank	Std. Dev.	Minimum	Maximum	N
Brainstorming	4.17	2	3.13	1.00	13.00	84
Stick 'em Up Brainstorming	3.13	1	2.70	1.00	12.00	84
Brainwriting	4.37	3	2.87	1.00	13.00	84
Forced Connections	5.65	4	3.08	1.00	13.00	84
SCAMPER	9.32	15	2.71	1.00	13.00	76
Visual Connections	6.25	6	2.97	1.00	13.00	83
Ladder of Abstraction	7.43	11	3.22	1.00	13.00	61
Excursions	9.95	17	2.99	1.00	13.00	44
Word Dance	9.29	13	2.78	2.00	13.00	49
Attribute Listing	9.29	14	2.73	4.00	13.00	17
Morphological Matrix	6.64	7	4.02	2.00	13.00	22
Highlighting	6.75	8	2.86	1.00	13.00	84
Hits	6.23	5	2.69	2.00	11.00	22
Praise First PPCo)/ALUo/LCOb	6.90	10	3.08	1.00	13.00	77
Card Sort	9.85	16	2.83	2.00	13.00	54
Evaluation Matrix	8.12	12	3.30	1.00	13.00	82
Paired Comparison Analysis	6.86	9	4.19	1.00	13.00	22

Table 4.7 portrays the mean and standard deviation for the enjoyment of learning CPS tools. The results outlined derive from the CPS tools listed in Section III of the CPSCS.

Participants were asked to rank order the items from most enjoyed (i.e., one) through least enjoyed (i.e., thirteen).

Due to differences in instruction from the five sections of CRS 559 and CRS 302, some of these tools varied based on the CPS process taught (i.e., Isaksen, Dorval & Treffinger, 1994; Vehar, Firestien & Miller, 1999). Both versions of the CPSCS (see Appendices I and J) contained 13 tools. There was some overlap of the tools between the two processes; however, seven tools varied among the surveys. The tool 'LCOb' was taught exclusively in one section of CRS 559 and is similar to Praise First (PPCo) and ALUo. Also, as noted in Table 4.5, some students did not learn all tools taught and therefore were not required to rank them.

The tool 'Stick 'em Up Brainstorming' was most enjoyed, with a mean of 3.13, a standard deviation of 2.70 and n = 84. 'Excursions' was least enjoyed, with a mean of 9.95, a standard deviation of 2.99 and n = 44. Six CPS tools did not receive the highest possible ranking (i.e., one) and/or the lowest possible ranking (i.e., thirteen).

For Tables 4.8 through 4.10, a non-parametric procedure was used to compare the enjoyment of learning CPS components, principles, stages and tools to the BCPI preferences. A Kruskal-Wallis One-way ANOVA was calculated and the results are listed in the aforementioned tables. It is important to note that calculations were performed on all items listed in Part I of the CPSCS with reported BCPI preferences; however, only those calculations that were statistically significant or approached significance are reported. Also, calculations reported were corrected for ties.

Table 4.8 depicts all significant correlations for BCPI preferences and the enjoyment of learning CPS components and stages. For this analysis, groups were created by using the ranks for enjoyment of learning CPS components and stages. BCPI preference scores for these groups were then compared for significant differences. A low mean indicates a relatively low BCPI preference score, a high mean for this analysis indicates a relatively high preference score. Through calculation using a Kruskal-Wallis One-way ANOVA, significant mean differences

were found among three of the four BCPI preferences. Both High Clarifiers and High Developers enjoyed the CPS component 'Explore the Challenge.' Low Developers and Low Ideators did enjoy this CPS component. High Ideators also enjoyed the CPS stage 'Select and Strengthen Solutions.'

Table 4.8

Kruskal-Wallis One-way ANOVA by Buffalo Creative Process Inventory Preferences for the Enjoyment of Learning Creative Problem Solving Components and Stages

CPS Variable	BCPI Preference	Mean	Rank	N	Chi-Square	Significance
Explore the Challenge	Clarifier	60.32 36.18 38.67	1 2 3	19 36 29	13.2856	.0013
Explore the Challenge	Developer	58.00 38.35 37.50	1 2 3	19 36 29	9.9466	.0069
Generate Ideas	Ideator	39.66 41.19 56.12	1 2 3	55 16 13	4.8634	.0879
Generate Ideas	Developer	37.11 51.13 54.69	1 2 3	55 16 13	7.9449	.0188
Select & Strengthen Solutions	Ideator	19.13 57.97 41.69 47.68 31.92 45.04	1 2 3 4 5 6	4 18 13 11 25 13	16.3477	.0059
Plan for Action	Clarifier	8.00 29.21 29.83 54.58 49.47 44.19	1 2 3 4 5 6	1 7 15 12 17 32	12.6267	.0271

Table 4.9 highlights another calculation of a Kruskal-Wallis One-way ANOVA to determine individuals with high BCPI preferences and their enjoyment of learning CPS stages, principles and tools. For this analysis, high preference groups were created and ranked for the stages, principles or tools compared across the four high preference groups, respectively. High

Developers enjoyed learning the CPS stage 'Identify Goal, Wish or Challenge' and the CPS principle 'Check Your Objectives.' Although when it came to learning the CPS principle 'Seeking Wild and Unusual Ideas,' this same group of High Developers did not enjoy learning this technique. High Ideators were discovered to not enjoy learning the CPS principle 'Defer Judgment;' and High Clarifiers enjoyed learning the CPS tool 'Ladder of Abstraction.' High Developers enjoyed the CPS stage 'Plan for Action.'

Table 4.9

Kruskal-Wallis One-way ANOVA

by High Buffalo Creative Process Inventory Preferences

for the Enjoyment of Learning Creative Problem Solving Stages, Principles and Tools

CPS Variable	BCPI Pref. Group	Mean	N	Chi-Square	Significance
Identify Goal, Wish or Challenge	Clarifiers	32.71	19	12.5957	.0056
	Ideators	45.24	21		
	Developers	16.29	7		
	Implementers	45.02	31		
Defer Judgment	Clarifiers	25.29	19	7.8506	.0492
	Ideators	43.64	14		
	Developers	36.83	6		
	Implementers	33.28	27		
Seeking Wild & Unusual Ideas	Clarifiers	39.58	19	7.7707	.0510
	Ideators	38.63	20		
	Developers	60.00	7		
	Implementers	34.15	31		
Check Your Objectives	Clarifiers	51.53	19	9.6226	.0221
	Ideators	33.33	21		
	Developers	26.00	7		
	Implementers	39.35	31		
Ladder of Abstraction	Clarifiers	17.83	12	9.4155	.0242
	Ideators	33.15	17		
	Developers	21.10	5		
	Implementers	33.48	23		
Plan for Action	Clarifiers	48.89	19	6.7295	.0810
	Ideators	40.48	21		
	Developers	42.00	7		
	Implementers	32.52	31		

Table 4.10 depicts the calculation of a Kruskal-Wallis One-way ANOVA to examine low BCPI preference groups across ranks for CPS stages with respect to enjoyment. The CPS stage of 'Identify Goal, Wish or Challenge' was enjoyed by Low Ideators. Low Developers did not enjoy learning the CPS stage of 'Clarify the Problem.' The CPS stage of 'Plan for Action' was enjoyed by Low Clarifiers, but not by Low Ideators nor Low Implementers.

Table 4.11 is the last set of results to be examined in this section. A Mann-Whitney U – Wilcoxon Rank Sum W Test was calculated to determine the enjoyment of learning CPS components, stages, principles and tools by comparing high and low BCPI preference groups. High and low preference groups were created by using a + or – half standard deviation based on the mean score for the four respective BCPI preferences (see Table 4.3).

High Ideators dominated the results by not enjoying learning CPS tools, specifically divergent thinking techniques such as 'Brainstorming' and 'Brainwriting.' They also did not like

Table 4.10

Kruskal-Wallis One-way ANOVA

by Low Buffalo Creative Process Inventory Preferences

for the Enjoyment of Learning Creative Problem Solving Stages

CPS Variable	BCPI Preference	Mean	N	Chi-Square	Significance
Identify Goal, Wish or Challenge	Clarifiers	44.00	17	7.8728	.0487
	Ideators	25.50	15		
	Developers	41.73	22		
	Implementers	34.34	19		
Clarify the Problem	Clarifiers	36.97	17	7.5015	.0575
	Ideators	30.60	15		
	Developers	46.48	22		
	Implementers	31.11	19		
Plan for Action	Clarifiers	25.85	17	8.9978	.0293
	Ideators	43.87	15		
	Developers	35.18	22		
	Implementers	43.66	19		

learning the CPS convergent thinking technique 'Evaluation Matrix.' Although High Ideators enjoyed learning the CPS tool 'Praise First (PPCo)/ALUo/LCOb,' the Low Ideators did not like

learning the CPS tool 'Word Dance' and the CPS principle 'Be Affirmative.' High Developers did not enjoy learning the CPS tools 'Brainstorming, Stick 'em Up Brainstorming, Brainwriting

Table 4.11

Mann-Whitney U – Wilcoxon Rank Sum W Test

by High and Low Buffalo Creative Process Inventory Preference Groups

for the Enjoyment of Learning

Creative Problem Solving Components, Stages, Principles and Tools

CPS Variable	BCPI Preference	Mean	N	Z	Two-Tailed P
Stick 'em Up Brainstorming	Low Clarifiers	24.18	30	-2.3800	.0173
	High Clarifiers	34.35	27		
Brainstorming	Low Ideators	26.33	30	-2.0448	.0409
	High Ideators	35.52	31		
Brainwriting	Low Ideators	25.98	30	-2.2105	.0271
	High Ideators	35.85	31		
Praise First (PPCo)/ALUo/LCOb	Low Ideators	32.33	27	-1.7071	.0878
	High Ideators	24.93	29		
Evaluation Matrix	Low Ideators	24.05	29	-2.7794	.0054
	High Ideators	36.53	31		
Word Dance	Low Ideators	23.76	17	-2.1550	.0312
	High Ideators	16.05	21		
Be Affirmative	Low Ideators	36.45	30	-2.3717	.0177
	High Ideators	25.73	31		
Brainstorming	Low Developers	21.80	25	-1.8139	.0697
	High Developers	29.20	25		
Stick 'em Up Brainstorming	Low Developers	21.36	25	-2.0692	.0385
	High Developers	29.64	25		
Brainwriting	Low Developers	22.16	25	-1.6516	.0986
	High Developers	28.84	25		
Forced Connections	Low Developers	21.36	25	-2.0220	.0432
	High Developers	29.64	25		
Evaluation Matrix	Low Developers	21.50	25	-1.6914	.0908
	High Developers	28.36	25		
Seeking Wild & Unusual Ideas	Low Developers	20.92	25	-2.2443	.0248
	High Developers	30.08	25		
Be Affirmative	Low Developers	30.78	25	-2.5732	.0101
	High Developers	20.22	25		
Forced Connections	Low Implementers	21.02	25	-2.0026	.0452
	High Implementers	29.15	25		

and Forced Connections,' and the CPS principle 'Seeking Wild & Unusual Ideas.' Low Clarifiers did enjoy learning the CPS tool 'Stick 'em Up Brainstorming,' while Low Implementers enjoyed learning the CPS tool 'Forced Connections.'

This section summarized the quantitative results for the enjoyment of learning CPS components, stages, principles and tools. The next section will explain the quantitative results for the future value of CPS components, stages, principles and tools.

Quantitative Results for the Future Value of Creative Problem Solving Components, Stages, Principles and Tools

This section describes the quantitative results and calculations for the perceived future value of Creative Problem Solving components, stages, principles and tools. These results were obtained from Part Two of the Creative Problem Solving Course Survey (CPSCS), which is described in Appendices I and J.

Table 4.12 presents the mean and standard deviations for the perceived future value of using CPS components. Individuals were asked to rank order the CPS components from one (perceived to be most valuable) through three (perceived to be least valuable) in Section I-A of the CPSCS. 'Generating Ideas' had the lowest mean, 1.75 and a standard deviation of .76. 'Planning for Action' received the highest mean of 2.32 and a standard deviation of .76. All 84 participants rank ordered these options.

Table 4.13 outlines the mean and standard deviation for perceived future value of using CPS principles. These results derive from the list of CPS principles participants were asked to rank order from 'most preferred' (i.e., one) to 'least preferred' (i.e., twelve) from Section I-B of the CPSCS. The principles were categorized in same fashion as Part I, Section I-B. Also, due to differences in instruction from the five sections of CRS 559 and CRS 302, not all participants

Table 4.12

Mean and Standard Deviation

for the Future Value of Creative Problem Solving Components

Variable	Mean	Rank	Std. Dev.	Minimum	Maximum	N
Explore the Challenge	1.93	2	.83	1.00	3.00	84
Generating Ideas	1.75	1	.76	1.00	3.00	84
Planning for Action	2.32	3	.76	1.00	3.00	84

Table 4.13

Mean and Standard Deviation

for the Future Value of Creative Problem Solving Principles

Variable	Mean	Rank	Std. Dev.	Minimum	Maximum	N
Dynamic Balance	6.21	5	3.67	1.00	12.00	84
Divergent Thinking	4.44	2	3.17	1.00	11.00	84
Defer Judgment	3.68	1	2.88	1.00	12.00	84
Strive for Quantity	6.36	6	3.22	1.00	12.00	84
Seeking Wild & Unusual Ideas	6.13	4	3.53	1.00	12.00	83
Building Ideas	5.73	3	2.97	1.00	12.00	84
Convergent Thinking	6.57	7	2.90	2.00	12.00	77
Be Affirmative	7.17	10	3.17	1.00	12.00	83
Be Deliberate	8.33	12	2.70	2.00	12.00	84
Check Your Objectives	7.26	11	3.16	1.00	12.00	84
Improve Ideas	7.11	8	3.01	1.00	12.00	63
Consider Novelty	7.14	9	3.26	1.00	12.00	84

responded because either the principle was not covered or the individual was absent from class the day it was taught.

The CPS principle 'Defer Judgment' was viewed as being most valuable principle, with a mean of 3.68, a standard deviation of 2.88 and n = 84. 'Be Deliberate' was the least favored principle, which had a mean of 8.33, standard deviation of 2.70 and n = 84. It had a minimum of 2.00 and maximum of 12.00; therefore, no individual felt 'Be Deliberate' was their top choice.

Table 4.14 outlines the mean and standard deviation for the perceived future value of using CPS stages. Section II of the CPSCS asked participants to rank order CPS stages from one (most valued) through six (least valued). 'Clarify the Problem' was perceived to be most valuable, which had a mean of 2.75, a standard deviation of 1.47 and n = 84. 'Plan for Action' was perceived to be least valuable, which had a mean of 4.51, standard deviation of 1.67 and n = 84.

Table 4.14

Mean and Standard Deviation

for the Future Value of Creative Problem Solving Stages

Variable	Mean	Rank	Std. Dev.	Minimum	Maximum	N
Identify Goal, Wish or Challenge	3.46	3	1.88	1.00	6.00	84
Gather Data	3.49	4	1.56	1.00	6.00	84
Clarify Problems	2.75	1	1.47	1.00	6.00	84
Generate Ideas	2.98	2	1.64	1.00	6.00	84
Select & Strengthen Solutions	3.81	5	1.47	1.00	6.00	84
Plan for Action	4.51	6	1.67	1.00	6.00	84

Table 4.15

Mean and Standard Deviation

for the Future Value of Creative Problem Solving Tools

Variable	Mean	Rank	Std. Dev.	Minimum	Maximum	N
Brainstorming	4.64	3	3.80	1.00	13.00	84
Stick 'em Up Brainstorming	3.46	1	3.01	1.00	13.00	84
Brainwriting	4.60	2	2.95	1.00	12.00	84
Forced Connections	5.71	5	3.26	1.00	12.00	84
SCAMPER	8.91	13	3.22	1.00	13.00	77
Visual Connections	6.78	9	2.89	1.00	13.00	83
Ladder of Abstraction	6.92	10	3.26	1.00	13.00	61
Excursions	10.47	17	2.79	2.00	13.00	45
Word Dance	9.35	14	2.80	2.00	13.00	51
Attribute Listing	10.00	16	2.83	4.00	13.00	14
Morphological Matrix	7.91	12	3.57	2.00	13.00	22
Highlighting	6.08	7	2.57	1.00	12.00	84
Hits	5.82	6	2.70	1.00	12.00	22
Praise First (PPCo)/ALUo/LCOb	6.60	8	3.28	1.00	13.00	78
Card Sort	9.69	15	2.80	2.00	13.00	54
Evaluation Matrix	7.65	11	3.10	1.00	14.00	82
Paired Comparison Analysis	5.50	4	3.31	1.00	13.00	22

Table 4.15 portrays the mean and standard deviation for the perceived future value of using CPS tools. The results outlined derive from the CPS tools listed in Section III of the

CPSCS. Participants were asked to rank order the items from most valuable (i.e., one) through least valuable (i.e., thirteen).

As noted with the results for the enjoyment of learning CPS tools in the previous section of this chapter, there were differences in instruction from the five sections of CRS 559 and CRS 302. Some of the tools varied based on the CPS process taught in the course (i.e., Isaksen, Dorval & Treffinger, 1994; Vehar, Firestien & Miller, 1999). Both versions of the CPSCS (see Appendices I and J) contained 13 tools. Overlap existed between the tools of the two processes; however, seven tools varied among the surveys. The tool 'LCOb' was taught exclusively in one section of CRS 559 and is similar to Praise First (PPCo) and ALUo. Also, as noted in Table 4.13, some students did not learn all tools taught and therefore were not required to rank them.

The tool 'Stick 'em Up Brainstorming' was viewed as most valuable, with a mean of 3.46, a standard deviation of 3.01 and n = 84. 'Excursions' was least valuable, with a mean of 10.47, a standard deviation of 2.79 and n = 45. There were ten CPS tools that did not receive the highest possible ranking (i.e., one) and/or the lowest possible ranking (i.e., thirteen). The CPS tool 'Evaluation Matrix' received a least valuable ranking of 14.00, probably due to ranking error.

For Tables 4.16 through 4.18, a Kruskal-Wallis One-way ANOVA was used to obtain results in order to compare the future value of using CPS components, principles, stages and tools to BCPI preferences. It is important to note again that calculations were performed on all items listed in Part II of the CPSCS with reported BCPI preferences and only those calculations that were significant or approached significance were reported. Also, calculations reported were corrected for ties.

Table 4.16 depicts all significant results and those that approached significance for BCPI preferences and the future value of using CPS components and stages. For this analysis, high preference groups were created and then ranks for the stages, principles or tools were compared across the four high preference groups, respectively. A low mean indicates a relatively low BCPI

Table 4.16

Kruskal-Wallis One-way ANOVA by Buffalo Creative Process Inventory Preferences for the Future Value of Creative Problem Solving Components and Stages

CPS Variable	BCPI Preference	Mean	Rank	N	Chi-Square	Significance
Explore the Challenge	Clarifier	49.41	1	32	5.0964	.0782
		41.54	2	26		
		34.96	3	26		
Explore the Challenge	Developer	45.88	1	32	5.3973	.0673
		47.52	2	26		
		33.33	3	26		
Generate Ideas	Ideator	38.08	1	38	9.9508	.0069
		38.90	2	30		
		59.75	3	16		
Generate Ideas	Developer	39.34	1	38	7.3448	.0254
		38.58	2	30		
		57.34	3	16		
Identify Goal, Wish or Challenge	Clarifier	47.24	1	17	12.1004	.0334
		56.94	2	16		
		33.80	3	10		
		39.11	4	14		
		22.50	5	6		
		39.79	6	21		
Generating Ideas (stage)	Ideator	41.75	1	22	14.9628	.0105
		35.71	2	14		
		39.47	3	15		
		34.53	4	19		
		67.30	5	5		
		63.00	6	9		
Select & Strengthen Solutions	Clarifier	32.75	1	4	9.5883	.0878
		28.38	2	16		
		48.75	3	16		
		41.33	4	12		
		45.13	5	27		
		54.50	6	9		

preference score, a high mean for this analysis indicates a relatively high preference score. Through calculation using a Kruskal-Wallis One-way ANOVA, significant mean differences were found among three of the four BCPI preferences (no significant results were found for Implementers). High Clarifiers did not perceive future value of the CPS component 'Explore the Challenge,' but Low Clarifiers believe it would be valuable. The Low Clarifiers also did not

perceive much future value in regard to CPS stages 'Identify Goal, Wish or Challenge' and 'Select and Strengthen Solutions.' High Ideators did not see future value for the CPS component 'Generate Ideas' and the CPS stage 'Generating Ideas.' High Developers did not see future value in using the CPS components 'Explore the Challenge' and 'Generate Ideas.'

Table 4.17 highlights another calculation of a Kruskal-Wallis One-way ANOVA to determine the future value of using CPS principles and tools by high BCPI preferences. For this analysis high preference groups for all four BCPI preference were compared (see Table 4.3). High Developers believe that the CPS tool 'Ladder of Abstraction' would be valuable to them in the future. High Ideators reported that the CPS principle 'Strive for Quantity' would not be valuable in their future.

Table 4.17

Kruskal-Wallis One-way ANOVA

by High Buffalo Creative Process Inventory Preferences

for the Future Value of Creative Problem Solving Principles and Tools

CPS Variable	BCPI Pref. Grp.	Mean	N	Chi-Square	Significance
Ladder of Abstraction	Clarifiers	23.29	12	11.6814	.0086
	Ideators	31.24	17		
	Developers	9.10	5		
	Implementers	34.65	23		
Strive for Quantity	Clarifiers	34.00	19	6.6163	.0852
	Ideators	50.12	21		
	Developers	38.93	7		
	Implementers	35.81	31		

Table 4.18 depicts a Kruskal-Wallis One-way ANOVA calculation to determine the future value of CPS principles and tools by low BCPI preference groups. Low Developers did not see future value of using the CPS principle 'Defer Judgment.' The CPS tool 'Visual Connections' had no future value for Low Ideators.

Table 4.19 presents the results of the Mann-Whitney U – Wilcoxon Rank Sum W Test calculation to determine the future value of using CPS components, stages, principles and tools

by high and low BCPI preference groups. Low Clarifiers found the CPS tools 'Brainwriting and Visual Connections' to possess greater future value. High Ideators believe the CPS tools of

Table 4.18

Kruskal-Wallis One-way ANOVA

by Low Buffalo Creative Process Inventory Preferences

for the Future Value of Creative Problem Solving Principles and Tools

CPS Variable	BCPI Pref. Grp.	Mean	N	Chi-Square	Significance
Defer Judgment	Clarifiers	38.21	17	7.6243	.0544
	Ideators	37.57	15		
	Developers	44.59	22		
	Implementers	26.68	19		
Visual Connections	Clarifiers	32.71	17	7.7301	.0519
	Ideators	49.60	15		
	Developers	31.84	22		
	Implementers	34.86	18		

'Brainstorming and Brainwriting' will not be very useful in the future, but believe the CPS tool of 'Praise First (PPCo)/ALUo/LCOb' will be useful. The CPS principles of 'Seeking Wild & Unusual Ideas and Building Ideas' was seen as not being very useful by High Developers, and the CPS principle of 'Be Affirmative' as having future value. High Developers do not see future value in the CPS tools 'Stick 'em Up Brainstorming and Brainwriting,' but report that the CPS tool 'Praise First (PPCo)/ALUo/LCOb' will be useful. 'Strive for Quantity, Seeking Wild & Unusual Ideas and Building Ideas' were found not to be of future use to High Developers, and 'Be Affirmative' was found to be useful to them in the future.

This section described the quantitative results and calculations for the perceived future value of Creative Problem Solving components, stages, principles and tools. The next section will outline the qualitative results for this study.

Table 4.19

Mann-Whitney U – Wilcoxon Rank Sum W Test

by High and Low Buffalo Creative Process Inventory Preference Groups

for the Future Value of

Creative Problem Solving Components, Stages, Principles and Tools

CPS Variable	BCPI Preference	Mean	N	Z	Two-Tailed P
Brainwriting	Low Clarifiers	24.42	30	-2.2233	.0262
	High Clarifiers	34.09	27		
Visual Connections	Low Clarifiers	24.77	30	-2.0403	.0413
	High Clarifiers	33.70	27		
Brainstorming	Low Ideators	24.87	30	-2.6803	.0074
	High Ideators	36.94	31		
Brainwriting	Low Ideators	23.83	30	-3.1445	.0017
	High Ideators	37.94	31		
Praise First (PPCo)/ALUo/LCOb	Low Ideators	35.35	27	-2.7551	.0059
	High Ideators	23.28	30		
Seeking Wild & Unusual Ideas	Low Ideators	25.90	30	-2.0504	.0403
	High Ideators	35.10	30		
Building Ideas	Low Ideators	26.60	30	-1.9185	.0551
	High Ideators	35.26	31		
Be Affirmative	Low Ideators	37.38	30	-2.7788	.0055
	High Ideators	24.82	31		
Stick ‘em Up Brainstorming	Low Developers	20.40	25	-2.5510	.0107
	High Developers	30.60	25		
Brainwriting	Low Developers	19.92	25	-2.7604	.0058
	High Developers	31.08	25		
Praise First (PPCo)/ALUo/LCOb	Low Developers	29.75	22	-3.0380	.0024
	High Developers	17.77	24		
Strive for Quantity	Low Developers	21.76	25	-1.8272	.0677
	High Developers	29.24	25		
Seeking Wild & Unusual Ideas	Low Developers	21.84	25	-1.7882	.0737
	High Developers	29.16	25		
Building Ideas	Low Developers	20.72	25	-2.3307	.0198
	High Developers	30.28	25		
Be Affirmative	Low Developers	30.36	25	-2.3686	.0179
	High Developers	20.64	25		

General Qualitative Results

The purpose of this section is to outline the qualitative results for this study. The three qualitative questions were designed to determine the following: (1) the student’s most significant learning from this course and why; (2) how will the student *personally* benefit from this course;

and (3) how will the student *professionally* benefit from this course. All 84 participants responded to Questions One and Three; however, only 83 of the 84 participants responded to Question Two.

The results from the three questions listed in Part III of the CPSCS are summarized here. Each question is categorized by theme (see Appendices A, C and E) and by high and low BCPI preferences (see Appendices B, D and F). Two CPS trained individuals were asked to organize the qualitative data from the three questions into the categories created by the writer. The rationale behind selecting two CPS trained individuals to cluster the qualitative data was due in part to the level of experience and expertise possessed by a trained CPS individual who thoroughly understood the CPS process. This was necessary in order to understand the results generated by the participants. Untrained CPS individuals would not have achieved this goal.

Question One was organized by themes that emerged from clustering the data. Both individuals who organized the data came up with similar themes and their combined inter-rater agreement was approximately 95%. Questions Two and Three required an initial clustering of the data; however, inter-rater agreement was low. The two CPS trained individuals were asked once again to cluster the data by prescribed data themes and the inter-rater agreement was approximately 92%. It is important to note that although the inter-rater agreements were high for the three questions, both individuals perceived the data differently due to personal experiences and knowledge of the CPS process. The category themes generated are not absolute; therefore, other CPS trained individuals could have generated different category themes.

Table 4.20 describes the category themes to Question One of the CPSCS. Individuals were asked to describe their most significant learning from the course and why. The first number in the parenthesis following the theme identifies the number of individuals with a response that fit into that theme. The second number indicates the total number of participants who could have responded to the question. Out of the 84 Participants, 27 of them said learning the CPS principle

Table 4.20

Question One Category Themes

Creative Problem Solving as a Structured Process (15/84)
Deferring Judgment (27/84)
Dynamic Balance (5/84)
Personal Insights (5/84)
Professional Applications (3/84)
Style – Problem Solving and Defining, and Style Preferences (5/84)
Tools (16/84)
Understanding the Problem, Clarifying, Questioning (5/84)
Miscellaneous (3/84)

'Deferring Judgment' was most significant. There were 16 participants who described learning the CPS tools were important, followed by 15 participants reporting that learning the structure of the CPS process as significant. There were small numbers of other participants who discussed other key learnings derived from the course.

Tables 4.21 through 4.24 organize Question One qualitative data by identifying individuals who had a high and/or low overall score for one of the four BCPI preferences. Information with respect to identifying high and/or low overall preferences is found in Table 4.2. Individuals were selected by one of their four BCPI preference scores being highest and/or lowest overall for their reported style. Any individual who reported two or more identical BCPI preference scores, either high or low, were not included in these tables.

Table 4.21 describes the qualitative results of Question One organized for High and Low Clarifiers by Category Themes. High Clarifiers reported learning CPS tools (5/17) and the CPS principle 'Deferring Judgment' (4/17) as most important. One of the five High Clarifiers

mentioned 'Task Analysis' as an important CPS tool. High Clarifiers also believed learning the CPS principle 'Deferring Judgment' allowed them to explore options and even improve their personal lives.

Low Clarifiers reported the CPS principle 'Deferring Judgment' (6/17) and CPS tools (3/17) as significant in their learning. They also shared similar viewpoints with High Clarifiers on the CPS principle 'Deferring Judgment.' Low Clarifiers also identified the CPS tools 'Visual Connections and Card Sort' were meaningful in their learnings. One Low Clarifier reported that

Table 4.21

Question One Qualitative Results for

High and Low Clarifiers by Category Themes

High Clarifiers	**Low Clarifiers**
Creative Problem Solving as a Structured Process (2/17)	Creative Problem Solving as a Structured Process (2/17)
Deferring Judgment (4/17)	Deferring Judgment (6/17)
Dynamic Balance (2/17)	Dynamic Balance (1/17)
Personal Insights (2/17)	Personal Insights (0/17)
Professional Applications (0/17)	Professional Applications (2/17)
Style – Problem Solving and Defining, and Style Preferences (1/17)	Style – Problem Solving and Defining, and Style Preferences (1/17)
Tools (5/17)	Tools (3/17)
Understanding the Problem, Clarifying, Questioning (1/17)	Understanding the Problem, Clarifying, Questioning (1/17)
Miscellaneous (0/17)	Miscellaneous (1/17)

learning how to clarify a problem and use of statement starters would save time in solving a problem and by focusing on the correct problem. This statement seems to reflect a low Clarifiers insight with regard to the value associated with problem-solving techniques.

Table 4.22 outlines the qualitative results of Question One organized for High and Low Ideators by Category Themes. Six of 19 High Ideators mentioned 'CPS as a Structured Process'

to be meaningful to them. These six High Ideators found the CPS process brought structure to how they identify and solve problems. Only one High Ideator reported that learning a variety of tools and techniques was important. Another High Ideator believed learning 'Dynamic Balance' and the CPS tool 'Ladder of Abstraction' were new ways of developing ideas.

Table 4.22

Question One Qualitative Results for

High and Low Ideators by Category Themes

High Ideators	**Low Ideators**
Creative Problem Solving as a Structured Process (6/19)	Creative Problem Solving as a Structured Process (1/15)
Deferring Judgment (2/19)	Deferring Judgment (7/15)
Dynamic Balance (2/19)	Dynamic Balance (0/15)
Personal Insights (0/19)	Personal Insights (1/15)
Professional Applications (1/19)	Professional Applications (0/15)
Style – Problem Solving and Defining, and Style Preferences (3/19)	Style – Problem Solving and Defining, and Style Preferences (1/15)
Tools (1/19)	Tools (3/15)
Understanding the Problem, Clarifying, Questioning (2/19)	Understanding the Problem, Clarifying, Questioning (2/15)
Miscellaneous (2/19)	Miscellaneous (0/15)

Low Ideators (7/15) reported learning the CPS principle 'Deferring Judgment' had impact on their lives. It was important for Low Ideators to learn not to be negative towards new ideas and learning how to carry ideas to another level by simply suspending judgment. It is interesting to note that only 2 of 19 High Clarifiers mentioned the CPS principle 'Deferring Judgment.' Three Low Ideators identified CPS tools were important. One of them said learning the CPS tools 'Forced Connections, Brainwriting and Stick 'em Up Brainstorming' were key in understanding how to generate ideas. One Low Ideator also mentioned the CPS tool 'Praise First (PPCo)/ALUo/LCOb' in understanding how to identify and overcome problems.

Table 4.23

Question One Qualitative Results for

High and Low Developers by Category Themes

High Developers	**Low Developers**
Creative Problem Solving as a Structured Process (1/7)	Creative Problem Solving as a Structured Process (7/21)
Deferring Judgment (1/7)	Deferring Judgment (4/21)
Dynamic Balance (0/7)	Dynamic Balance (2/21)
Personal Insights (0/7)	Personal Insights (2/21)
Professional Applications (0/7)	Professional Applications (1/21)
Style – Problem Solving and Defining, and Style Preferences (0/7)	Style – Problem Solving and Defining, and Style Preferences (1/21)
Tools (2/7)	Tools (3/21)
Understanding the Problem, Clarifying, Questioning (2/7)	Understanding the Problem, Clarifying, Questioning (0/21)
Miscellaneous (1/7)	Miscellaneous (1/21)

Table 4.23 outlines the qualitative results of Question One organized for High and Low Developers by Category Themes. Of the seven High Developers, two mentioned CPS tools as important. One mentioned the CPS tool 'Praise First (PPCo)/ALUo/LCOb' to consider the positives of an idea before its negatives. Two other High Developers discussed the importance of 'Understanding the Problem, Clarifying, Questioning.' Again, the CPS tool 'Praise First (PPCo)/ALUo/LCOb' was mentioned. With two High Developers mentioned the CPS tool 'Praise First (PPCo)/ALUo/LCOb,' this tool clearly reflects the preference characteristics of a Developer.

Low Developers (7/21) mentioned 'CPS as a Structured Process' the most. They believed the structure and its incorporation of divergent and convergent thinking processes was significant. Four Low Developers thought the CPS principle 'Deferring Judgment' was an important habit to practice and not to dismiss ideas too quickly.

Table 4.24

Question One Qualitative Results for

High and Low Implementers by Category Themes

High Implementers	**Low Implementers**
Creative Problem Solving as a Structured Process (6/31)	Creative Problem Solving as a Structured Process (2/19)
Deferring Judgment (15/31)	Deferring Judgment (6/19)
Dynamic Balance (1/31)	Dynamic Balance (0/19)
Personal Insights (2/31)	Personal Insights (2/19)
Professional Applications (1/31)	Professional Applications (0/19)
Style – Problem Solving and Defining, and Style Preferences (1/31)	Style – Problem Solving and Defining, and Style Preferences (1/19)
Tools (5/31)	Tools (6/19)
Understanding the Problem, Clarifying, Questioning (0/31)	Understanding the Problem, Clarifying, Questioning (1/19)
Miscellaneous (0/31)	Miscellaneous (1/19)

Table 4.24 the qualitative results of Question One organized for High and Low Implementers by Category Themes. High Implementers (15/31) reported the CPS principle 'Deferring Judgment' as most important. These individuals believe that it is critical to see many ideas and their novelty. High Implementers (5/31) also mentioned CPS tools 'Brainwriting, Visual Connections and Card Sort.'

Low Implementers (6/19) also believe the CPS principle 'Deferring Judgment' was meaningful to learn. One Low Implementer reported that deferring judgment had an impact in numerous personal and professional settings. Low Implementers (6/19) felt CPS tools were beneficial. Two Low Implementers mentioned the CPS tool 'Praise First (PPCo)/ALUo/LCOb,' which allowed them to look at ideas positively first.

Table 4.25 focuses on Question One qualitative results by category themes for high individuals' across the four BCPI preferences. The CPS principle 'Deferring Judgment' was

referred to as meaningful to High Implementers. The comments listed in the aforementioned category were similar in that power of suspending ones personal judgment and allowing ideas to flourish was consequential. Learning both CPS tools and the CPS process itself were deemed as important to high preference individuals in all four BCPI preferences. In terms of other key findings, both High Ideators and Implementers believe the structure of the CPS process as important.

Table 4.26 describes the qualitative results for Question One by category themes for low individuals' BCPI preferences. Again, the CPS principle 'Deferring Judgment' was mentioned most, with the highest percentage of comments coming from Low Ideators. The comments given by individuals with low preferences were similar in that suspending judgment is critical in everyday life. CPS tools and the CPS process were also mentioned, as they were by people with high preferences. Both Low Ideators and Implementers said nothing with respect to the 'Dynamic Balance.'

All in all, the findings reported by Question One indicate that individuals with high and low BCPI preferences believe the CPS principle 'Deferring Judgment' is meaningful in ones life. Specific CPS tools were mentioned by these individuals and some of the tools fit the preference of which being described. Also, the structure of the CPS process was mentioned as being important in clarifying problems, generating ideas and developing action plans.

Table 4.25

Question One Qualitative Results by Category Themes

for High Buffalo Creative Process Inventory Preferences

High Clarifiers	**High Ideators**
Creative Problem Solving as a Structured Process (2/17)	Creative Problem Solving as a Structured Process (6/19)
Deferring Judgment (4/17)	Deferring Judgment (2/19)
Dynamic Balance (2/17)	Dynamic Balance (2/19)
Personal Insights (2/17)	Personal Insights (0/19)
Professional Applications (0/17)	Professional Applications (1/19)
Style – Problem Solving and Defining, and Style Preferences (1/17)	Style – Problem Solving and Defining, and Style Preferences (3/19)
Tools (5/17)	Tools (1/19)
Understanding the Problem, Clarifying, Questioning (1/17)	Understanding the Problem, Clarifying, Questioning (2/19)
Miscellaneous (0/17)	Miscellaneous (2/19)
High Developers	**High Implementers**
Creative Problem Solving as a Structured Process (1/7)	Creative Problem Solving as a Structured Process (6/31)
Deferring Judgment (1/7)	Deferring Judgment (15/31)
Dynamic Balance (0/7)	Dynamic Balance (1/31)
Personal Insights (0/7)	Personal Insights (2/31)
Professional Applications (0/7)	Professional Applications (1/31)
Style – Problem Solving and Defining, and Style Preferences (0/7)	Style – Problem Solving and Defining, and Style Preferences (1/31)
Tools (2/7)	Tools (5/31)
Understanding the Problem, Clarifying, Questioning (2/7)	Understanding the Problem, Clarifying, Questioning (0/31)
Miscellaneous (1/7)	Miscellaneous (0/31)

Table 4.26

Question One Qualitative Results by Category Themes

for Low Buffalo Creative Process Inventory Preferences

Low Clarifiers	**Low Ideators**
Creative Problem Solving as a Structured Process (2/17)	Creative Problem Solving as a Structured Process (1/15)
Deferring Judgment (6/17)	Deferring Judgment (7/15)
Dynamic Balance (1/17)	Dynamic Balance (0/15)
Personal Insights (0/17)	Personal Insights (1/15)
Professional Applications (2/17)	Professional Applications (0/15)
Style – Problem Solving and Defining, and Style Preferences (1/17)	Style – Problem Solving and Defining, and Style Preferences (1/15)
Tools (3/17)	Tools (3/15)
Understanding the Problem, Clarifying, Questioning (1/17)	Understanding the Problem, Clarifying, Questioning (2/15)
Miscellaneous (1/17)	Miscellaneous (0/15)
Low Developers	**Low Implementers**
Creative Problem Solving as a Structured Process (7/21)	Creative Problem Solving as a Structured Process (2/19)
Deferring Judgment (4/21)	Deferring Judgment (6/19)
Dynamic Balance (2/21)	Dynamic Balance (0/19)
Personal Insights (2/21)	Personal Insights (2/19)
Professional Applications (1/21)	Professional Applications (0/19)
Style – Problem Solving and Defining, and Style Preferences (1/21)	Style – Problem Solving and Defining, and Style Preferences (1/19)
Tools (3/21)	Tools (6/19)
Understanding the Problem, Clarifying, Questioning (0/21)	Understanding the Problem, Clarifying, Questioning (1/19)
Miscellaneous (1/21)	Miscellaneous (1/19)

Table 4.27

Question Two Category Themes

Change in Attitude Towards Others (2/83)
Deferring Judgment (10/83)
Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (23/83)
Tools for Effective Thinking/Decision Making (24/83)
Understanding Cognitive Style/Style of Creativity (6/83)
Use of a Deliberate Process (14/83)
Miscellaneous (4/83)

Table 4.27 describes the category themes to Question Two of the CPSCS. Individuals were asked how one would personally benefit from this course. There were a total of 83 participants who responded to this question. Of the 83, 24 individuals said comments that belonged to the category 'Tools for Effective Thinking/Decision Making.' 'Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence' was mentioned by 23 of the 83 participants as what they will benefit from this course personally in the future. There were small numbers of other participants who discussed other key learnings they believe will benefit them on a personal level.

Tables 4.28 through 4.31 organize Question Two qualitative data by identifying individuals who had a high and/or low overall score for one of the four BCPI preferences. Information with respect to identifying high and/or low overall preferences is found in Table 4.2. Individuals were selected by one of their four BCPI preference scores being highest and/or lowest overall for their reported style. Any individual who reported two or more identical BCPI preference scores, either high or low, were not included in these tables.

Table 4.28 focuses on the qualitative results of Question Two organized by High and Low Clarifiers by Category Themes. High Clarifiers (8/19) believe 'Tools for Effective Thinking/Decision Making' will serve them after the course. High Clarifiers see the CPS tools assisting them in solving everyday problems personally and professionally. One High Clarifier also mentioned the use of a 'Task Analysis' in approaching problems. Six of the 19 High Clarifiers mentioned comments regarding 'Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence.' They believe what was taught in the course will help them achieve goals and improve personal relationships.

Low Clarifiers (5/17) had comments that belonged to the category 'Use of a Deliberate Process.' They felt the CPS process allowed solving problems more creatively and helped in putting ideas into action. Four of 17 Low Clarifiers believed they would benefit most in the category of 'Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence.' They felt an increased level of self-awareness and more confident in challenging situations.

Table 4.28

Question Two Qualitative Results for

High and Low Clarifiers by Category Themes

High Clarifiers	**Low Clarifiers**
Change in Attitude Towards Others (0/19)	Change in Attitude Towards Others (0/17)
Deferring Judgment (2/19)	Deferring Judgment (3/17)
Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (6/19)	Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (4/17)
Tools for Effective Thinking/Decision Making (8/19)	Tools for Effective Thinking/Decision Making (3/17)
Understanding Cognitive Style/Style of Creativity (2/19)	Understanding Cognitive Style/Style of Creativity (0/17)
Use of a Deliberate Process (1/19)	Use of a Deliberate Process (5/17)
Miscellaneous (0/19)	Miscellaneous (2/17)

Table 4.29

Question Two Qualitative Results for

High and Low Ideators by Category Themes

High Ideators	**Low Ideators**
Change in Attitude Towards Others (1/21)	Change in Attitude Towards Others (1/15)
Deferring Judgment (0/21)	Deferring Judgment (2/15)
Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (8/21)	Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (3/15)
Tools for Effective Thinking/Decision Making (5/21)	Tools for Effective Thinking/Decision Making (3/15)
Understanding Cognitive Style/Style of Creativity (1/21)	Understanding Cognitive Style/Style of Creativity (3/15)
Use of a Deliberate Process (4/21)	Use of a Deliberate Process (1/15)
Miscellaneous (2/21)	Miscellaneous (1/15)

Table 4.29 lists the qualitative results for High and Low Ideators by Category Themes. High Ideators (8/21) had comments that fell into the category 'Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence.' They reported not looking at problems the same way and the challenge of incorporating the CPS process into ones life. There were five of 21 High Ideators who believed they would benefit most in 'Tools for Effective Thinking/Decision Making.' One High Ideator felt because there were many concepts taught in the course that the individual saw many applications for everyday life.

The majority of Low Ideators were spread among three categories. Three Low Ideators reported in the 'Understanding Cognitive Style/Style of Creativity' category. One Low Ideator mentioned that by understanding ones creativity style and the ability to know how to use the CPS process and tools in everyday life. Another Low Ideator mentioned the development of a new style at solving problems. The last Low Ideator in this category mentioned the Kirton Adaption-Innovation Inventory in understanding ones creativity style.

Table 4.30

Question Two Qualitative Results for

High and Low Developers by Category Themes

High Developers	**Low Developers**
Change in Attitude Towards Others (0/7)	Change in Attitude Towards Others (1/22)
Deferring Judgment (2/7)	Deferring Judgment (2/22)
Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (1/7)	Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (6/22)
Tools for Effective Thinking/Decision Making (0/7)	Tools for Effective Thinking/Decision Making (9/22)
Understanding Cognitive Style/Style of Creativity (1/7)	Understanding Cognitive Style/Style of Creativity (2/22)
Use of a Deliberate Process (1/7)	Use of a Deliberate Process (2/22)
Miscellaneous (2/7)	Miscellaneous (0/22)

Table 4.30 focuses on the qualitative results of Question Two for High and Low Developers by Category Themes. High Developers (2/7) believed that the CPS principle 'Deferring Judgment' would benefit personally in the future. One High Developer would volunteer the pluses and potentials of an idea to others and stretch to solve problems. The other High Developer from this category believed that learning to defer judgment would be a plus in problem solving.

Low Developers (9/22) had responses that were categorized under 'Tools for Effective Thinking/Decision Making.' One Low Developer believed it was important to overcome limitations to problems. Another Low Developer mentioned the use of a 'Task Analysis' to approach problems. Six of 22 Low Developers reported thoughts that were organized with 'Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence.' They mentioned keeping an open mind and becoming more creative in life.

Table 4.31

Question Two Qualitative Results for

High and Low Implementers by Category Themes

High Implementers	**Low Implementers**
Change in Attitude Towards Others (1/30)	Change in Attitude Towards Others (0/19)
Deferring Judgment (5/30)	Deferring Judgment (1/19)
Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (6/30)	Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (8/19)
Tools for Effective Thinking/Decision Making (11/30)	Tools for Effective Thinking/Decision Making (6/19)
Understanding Cognitive Style/Style of Creativity (1/30)	Understanding Cognitive Style/Style of Creativity (1/19)
Use of a Deliberate Process (6/30)	Use of a Deliberate Process (2/19)
Miscellaneous (0/30)	Miscellaneous (1/19)

Table 4.31 depicts the qualitative results of Question Two organized for High and Low Implementers by Category Themes. High Implementers (11/30) had responses that were organized under the category 'Tools for Effective Thinking/Decision Making.' High Implementers mentioned the importance clarifying the problem, checking for ownership and incorporating tools into everyday thought processes. Six of 30 High Implementers had answered under the 'Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence' category. These High Implementers believe they know have an objective process to follow to solve problems and becoming more creative in their personal lives.

Low Implementers (8/19) also had responses in the 'Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence' category. The Low Implementers believe it will help in creating better personal lives, keeping a positive attitude and learning from ones mistakes.

Table 4.32

Question Two Qualitative Results by Category Themes

for High Buffalo Creative Process Inventory Preferences

High Clarifiers	**High Ideators**
Change in Attitude Towards Others (0/19)	Change in Attitude Towards Others (1/21)
Deferring Judgment (2/19)	Deferring Judgment (0/21)
Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (6/19)	Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (8/21)
Tools for Effective Thinking/Decision Making (8/19)	Tools for Effective Thinking/Decision Making (5/21)
Understanding Cognitive Style/Style of Creativity (2/19)	Understanding Cognitive Style/Style of Creativity (1/21)
Use of a Deliberate Process (1/19)	Use of a Deliberate Process (4/21)
Miscellaneous (0/19)	Miscellaneous (2/21)
High Developers	**High Implementers**
Change in Attitude Towards Others (0/7)	Change in Attitude Towards Others (1/30)
Deferring Judgment (2/7)	Deferring Judgment (5/30)
Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (1/7)	Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (6/30)
Tools for Effective Thinking/Decision Making (0/7)	Tools for Effective Thinking/Decision Making (11/30)
Understanding Cognitive Style/Style of Creativity (1/7)	Understanding Cognitive Style/Style of Creativity (1/30)
Use of a Deliberate Process (1/7)	Use of a Deliberate Process (6/30)
Miscellaneous (2/7)	Miscellaneous (0/30)

Table 4.32 describes the qualitative results for Question Two by category themes for high individuals' BCPI preferences. Individuals believed 'Tools for Effective Thinking/Decision Making' learned from this course would be most beneficial to them in the future. They also had a large sum of responses that were categorized under 'Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence.'

Table 4.33 focuses on the qualitative results for Question Two by category themes for low individuals' BCPI preferences. Individuals with low BCPI preferences reported the same two categories as the high preference counterparts, 'Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence and Tools for Effective Thinking/Decision Making.'

Table 4.33

Question Two Qualitative Results by Category Themes

for Low Buffalo Creative Process Inventory Preferences

Low Clarifiers	**Low Ideators**
Change in Attitude Towards Others (0/17)	Change in Attitude Towards Others (1/15)
Deferring Judgment (3/17)	Deferring Judgment (2/15)
Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (4/17)	Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (3/15)
Tools for Effective Thinking/Decision Making (3/17)	Tools for Effective Thinking/Decision Making (3/15)
Understanding Cognitive Style/Style of Creativity (0/17)	Understanding Cognitive Style/Style of Creativity (3/15)
Use of a Deliberate Process (5/17)	Use of a Deliberate Process (1/15)
Miscellaneous (2/17)	Miscellaneous (1/15)
Low Developers	**Low Implementers**
Change in Attitude Towards Others (1/22)	Change in Attitude Towards Others (0/19)
Deferring Judgment (2/22)	Deferring Judgment (1/19)
Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (6/22)	Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (8/19)
Tools for Effective Thinking/Decision Making (9/22)	Tools for Effective Thinking/Decision Making (6/19)
Understanding Cognitive Style/Style of Creativity (2/22)	Understanding Cognitive Style/Style of Creativity (1/19)
Use of a Deliberate Process (2/22)	Use of a Deliberate Process (2/19)
Miscellaneous (0/22)	Miscellaneous (1/19)

The findings reported by Question Two conclude that individuals with high and low BCPI preferences believe overall that the CPS tools taught in the course and how it effects them on a personal level was most beneficial. These results suggest that learning CPS had a tremendous effect on ones personal well-being and outlook on life in general.

Table 4.34 describes the category themes to Question Three of the CPSCS. Individuals were asked how one would professionally benefit from this course. Twenty-one of the 84 participants mentioned 'Enhancing/Improving Professional Setting' as most important. Also, two groups of 14 different individuals said 'Educational/Classroom Settings and Personal Improvements' were most important to them. There were small numbers of other participants who discussed how this course would benefit them professionally.

Table 4.34

Question Three Category Themes

Application of Tools (3/84)
Deferring Judgment (6/84)
Educational/Classroom Settings (14/84)
Enhancing/Improving Professional Setting (21/84)
Facilitation (As A Career/Job) (7/84)
Leadership Development (7/84)
Personal Improvements (14/84)
Problem Solving In A Group Setting (8/84)
Miscellaneous (4/84)

Tables 4.35 through 4.38 organize Question Three qualitative data by identifying individuals who had a high and/or low overall score for one of the four BCPI preferences. Information with respect to identifying high and/or low overall preferences is found in Table 4.2.

Individuals were selected by one of their four BCPI preference scores being highest and/or lowest overall for their reported style. Any individual who reported two or more identical BCPI preference scores, either high or low, were not included in these tables.

Table 4.35

Question Three Qualitative Results for

High and Low Clarifiers by Category Themes

High Clarifiers	**Low Clarifiers**
Application of Tools (3/19)	Application of Tools (2/17)
Deferring Judgment (1/19)	Deferring Judgment (0/17)
Educational/Classroom Settings (3/19)	Educational/Classroom Settings (3/17)
Enhancing/Improving Professional Setting (5/19)	Enhancing/Improving Professional Setting (4/17)
Facilitation (As A Career/Job) (1/19)	Facilitation (As A Career/Job) (1/17)
Leadership Development (1/19)	Leadership Development (2/17)
Personal Improvements (1/19)	Personal Improvements (2/17)
Problem Solving In A Group Setting (3/19)	Problem Solving In A Group Setting (2/17)
Miscellaneous (1/19)	Miscellaneous (1/17)

Table 4.35 outlines the qualitative results of Question Three organized for High and Low Clarifiers by Category Themes. High Clarifiers (5/19) had responses that were categorized under 'Enhancing/Improving Professional Setting.' These individuals feel that understanding the CPS process will help them in their respective professional fields.

The Low Clarifiers also believed 'Enhancing/Improving Professional Setting' was most important. Two of the 17 Low Clarifiers had responses that were organized under the category 'Personal Improvements.' One individual reported clarifying the problem and praising before criticizing were important.

Table 4.36

Question Three Qualitative Results for

High and Low Ideators by Category Themes

High Ideators	**Low Ideators**
Application of Tools (0/19)	Application of Tools (0/15)
Deferring Judgment (2/19)	Deferring Judgment (0/15)
Educational/Classroom Settings (2/19)	Educational/Classroom Settings (3/15)
Enhancing/Improving Professional Setting (5/19)	Enhancing/Improving Professional Setting (2/15)
Facilitation (As A Career/Job) (2/19)	Facilitation (As A Career/Job) (2/15)
Leadership Development (0/19)	Leadership Development (3/15)
Personal Improvements (5/19)	Personal Improvements (3/15)
Problem Solving In A Group Setting (3/19)	Problem Solving In A Group Setting (0/15)
Miscellaneous (0/19)	Miscellaneous (2/15)

Table 4.36 describes the qualitative results of Question Three organized by High and Low Ideators by Category Themes. High Ideators (5/19) mentioned 'Enhancing/Improving Professional Setting' as an important professional benefit. One High Ideator believed what was taught in the course would help in professional relationship building; while another High Ideator said it will be important to establish a creative environment in ones school building. Five of 19 High Ideators also mentioned 'Personal Improvements' as an important category. One High Ideator mentioned having greater personal understanding would enhance their professional identity.

Low Ideators reported thoughts under a variety of themes. Three of the 15 Low Ideators believed what was taught in the course will improve their 'Educational/Classroom Settings.' They would like to inspire other teachers about what was taught in their introductory CPS course. It would also help them in classroom management and activities.

Table 4.37

Question Three Qualitative Results for

High and Low Developers by Category Themes

High Developers	**Low Developers**
Application of Tools (0/7)	Application of Tools (0/22)
Deferring Judgment (0/7)	Deferring Judgment (2/22)
Educational/Classroom Settings (1/7)	Educational/Classroom Settings (0/22)
Enhancing/Improving Professional Setting (0/7)	Enhancing/Improving Professional Setting (10/22)
Facilitation (As A Career/Job) (0/7)	Facilitation (As A Career/Job) (2/22)
Leadership Development (2/7)	Leadership Development (0/22)
Personal Improvements (1/7)	Personal Improvements (6/22)
Problem Solving In A Group Setting (1/7)	Problem Solving In A Group Setting (1/22)
Miscellaneous (2/7)	Miscellaneous (0/22)

Table 4.37 outlines the qualitative results of Question Three organized for High and Low Developers by Category Themes. Two of the seven High Developers mentioned increased 'Leadership Development' as a result of this course. One of the High Developers said that by using the CPS tool 'Praise First (PPCo)/ALUo/LCOb' would help in solving or clarifying the right problem. This statement is a reflection of the Developer preference.

Low Developers (10/22) cited 'Enhancing/Improving Professional Setting' was important to their professional future. Low Developers would use the CPS skills taught to day-to-day work related responsibilities and assist in having tools to clarify problems. Six of the 22 Low Developers had responses that were organized under the 'Personal Improvements' category.

They now have a better way to generate ideas for solving problems and seeking involvement in situations that relate to ones personal style.

Table 4.38

Question Three Qualitative Results for

High and Low Implementers by Category Themes

High Implementers	**Low Implementers**
Application of Tools (0/31)	Application of Tools (3/19)
Deferring Judgment (3/31)	Deferring Judgment (1/19)
Educational/Classroom Settings (6/31)	Educational/Classroom Settings (4/19)
Enhancing/Improving Professional Setting (8/31)	Enhancing/Improving Professional Setting (3/19)
Facilitation (As A Career/Job) (2/31)	Facilitation (As A Career/Job) (1/19)
Leadership Development (4/31)	Leadership Development (1/19)
Personal Improvements (7/31)	Personal Improvements (2/19)
Problem Solving In A Group Setting (1/31)	Problem Solving In A Group Setting (3/19)
Miscellaneous (0/31)	Miscellaneous (1/19)

Table 4.38 depicts the qualitative results of Question Three organized for High and Low Implementers by Category Themes. Again, 'Enhancing/Improving Professional Setting' was selected by 8 of the 31 High Implementers. One High Implementer believed that creativity belongs in the workplace, while others feel what was taught in the course will help in them influencing their respective workplaces. Seven of 31 High Implementers believe 'Personal Improvements' will be a result of this course as well. They will deal with on-the-job challenges more effectively and will advance their problem solving abilities.

Low Implementers (4/19) had responses that fell into the category 'Educational/Classroom Settings.' These Low Implementers feel that the CPS process and techniques will help in the classroom and making class more fun and compelling for their students.

Table 4.39

Question Three Qualitative Results by Category Themes for High Buffalo Creative Process Inventory Preferences

High Clarifiers	**High Ideators**
Application of Tools (3/19)	Application of Tools (0/15)
Deferring Judgment (1/19)	Deferring Judgment (0/15)
Educational/Classroom Settings (3/19)	Educational/Classroom Settings (3/15)
Enhancing/Improving Professional Setting (5/19)	Enhancing/Improving Professional Setting (2/15)
Facilitation (As A Career/Job) (1/19)	Facilitation (As A Career/Job) (2/15)
Leadership Development (1/19)	Leadership Development (3/15)
Personal Improvements (1/19)	Personal Improvements (3/15)
Problem Solving In A Group Setting (3/19)	Problem Solving In A Group Setting (0/15)
Miscellaneous (1/19)	Miscellaneous (2/15)
High Developers	**High Implementers**
Application of Tools (0/7)	Application of Tools (0/31)
Deferring Judgment (0/7)	Deferring Judgment (3/31)
Educational/Classroom Settings (1/7)	Educational/Classroom Settings (6/31)
Enhancing/Improving Professional Setting (0/7)	Enhancing/Improving Professional Setting (8/31)
Facilitation (As A Career/Job) (0/7)	Facilitation (As A Career/Job) (2/31)
Leadership Development (2/7)	Leadership Development (4/31)
Personal Improvements (1/7)	Personal Improvements (7/31)
Problem Solving In A Group Setting (1/7)	Problem Solving In A Group Setting (1/31)
Miscellaneous (2/7)	Miscellaneous (0/31)

Table 4.40

Question Three Qualitative Results by Category Themes

for Low Buffalo Creative Process Inventory Preferences

Low Clarifiers	**Low Ideators**
Application of Tools (2/17)	Application of Tools (0/15)
Deferring Judgment (0/17)	Deferring Judgment (0/15)
Educational/Classroom Settings (3/17)	Educational/Classroom Settings (3/15)
Enhancing/Improving Professional Setting (4/17)	Enhancing/Improving Professional Setting (2/15)
Facilitation (As A Career/Job) (1/17)	Facilitation (As A Career/Job) (2/15)
Leadership Development (2/17)	Leadership Development (3/15)
Personal Improvements (2/17)	Personal Improvements (3/15)
Problem Solving In A Group Setting (2/17)	Problem Solving In A Group Setting (0/15)
Miscellaneous (1/17)	Miscellaneous (2/15)
Low Developers	**Low Implementers**
Application of Tools (0/22)	Application of Tools (3/19)
Deferring Judgment (2/22)	Deferring Judgment (1/19)
Educational/Classroom Settings (0/22)	Educational/Classroom Settings (4/19)
Enhancing/Improving Professional Setting (10/22)	Enhancing/Improving Professional Setting (3/19)
Facilitation (As A Career/Job) (2/22)	Facilitation (As A Career/Job) (1/19)
Leadership Development (0/22)	Leadership Development (1/19)
Personal Improvements (6/22)	Personal Improvements (2/19)
Problem Solving In A Group Setting (1/22)	Problem Solving In A Group Setting (3/19)
Miscellaneous (0/22)	Miscellaneous (1/19)

Table 4.39 outlines the Question Three qualitative results by category themes for high individuals' BCPI preferences. 'Enhancing/Improving Professional Setting' was most often reported as meaningful to these individuals professionally. They also see improvements to their 'Educational/Classroom Settings' as being vital as well. Also mentioned were 'Personal Improvements and Leadership Development.'

Table 4.40 describes the qualitative results for Question Three by category themes for low individuals' BCPI preferences. As their high preference counterparts mentioned, 'Enhancing/Improving Professional Setting' was a priority for low preference individuals as well. They mentioned 'Personal Improvements' next, followed by bettering their 'Educational/Classroom Settings.'

To conclude the findings for Question Three, the enhancement and/or improvement of ones professional setting was identified as being a critical result by taking an introductory to CPS course. Individuals also believed personal improvements learned through the CPS course would be valuable in bettering themselves professionally.

Conclusion

This chapter reviewed the findings and the analysis of the data gathered by this study. Quantitative and qualitative data were presented. Descriptive data organized by BCPI preference results were reported first, then the remaining data was organized by the enjoyment of learning and future value of using Creative Problem Solving components, principles, stages and techniques.

The next chapter provides implications and conclusions as result of conducting this research. It discusses both suggestions as well as recommendations for future research in this area.

Chapter Five: Summary and Implications for Further Study

Introduction

The purpose of this chapter is to discuss the findings of this study. The results are presented, followed by the implications of conducting this research. Lastly, suggestions and recommendations for future research in this area are presented.

General Learnings and Interpretation of the Findings

The overall learnings and the interpretation of these findings are explained in this section. It is important to clarify once again that the intent of this research study was exploratory and no hypotheses were established. It was deemed that to answer specific assumptions with regard to the BCPI would be inappropriate. This exploratory designation allowed for a variety of outcomes to be discovered.

There were many significant findings from this research. A key discovery found individuals enjoyed learning and saw future value in using CPS Components, Principles, Stages and Tools that were primarily divergent. This included the CPS Component 'Generating Ideas;' the CPS Principles of 'Defer Judgment, Divergent Thinking;' the CPS Stage 'Generate Ideas;' and the CPS Tools 'Brainstorming, Stick 'em Up Brainstorming, Brainwriting and Forced Connections.' This finding is not at all surprising since a considerable amount of time is spent in the Introductory to CPS courses on divergent thinking related fundamentals.

If one were to look at the above-mentioned finding, which focuses heavily on course impact, it would lead one to believe that the CPS Components, Principles, Stages and Tools which were primarily divergent are the most important to grasp. This of course is not the case.

Another significant finding in relation to individual differences was uncovered. Through the use of the BCPI in this study, an amazing discovery was found among High Ideators and their beliefs in regard to enjoyment of learning and future value of certain divergent thinking CPS Principles and Tools. This finding is significant in that it replicates findings of the Creative Studies Project (Noller & Parnes, 1972; Parnes & Noller, 1972a, 1972b, 1973).

A discovery from the Creative Studies Project revealed that the majority of students who dropped out of the Project were high divergent thinkers. These students did not believe that what they were being taught would assist them in being more divergent or even creative for that matter. It is important to note that a consequential portion of the curriculum used in the Creative Studies Project focused on teaching students how to be more divergent in their thinking. All in all the replication of the Creative Studies Project highlighted the importance of the BCPI in understanding how individuals solve problems creatively and differently.

Another intriguing insight involved how individuals perceived the future value of certain CPS Components, Principles, Stages and Tools. For example, High Ideators saw future value in using the CPS Tool 'Praise First (PPCo)/ALUo/LCOb.' High Ideators are individuals who like to generate lots of ideas and typically take an intuitive approach to solving problems (Puccio, 2000). These High Ideators may believe that by understanding how to use the CPS Tool 'Praise First (PPCo)/ALUo/LCOb' they will not rush into trying so many ideas at once.

This perceived future value of CPS Components, Stages, Principles and Tools which are outside of one's preference could be characterized as the 'skill gap phenomenon,' where by which an individual is trying to improve upon one's weaker preferences. This was also evident, for example with Low Clarifiers, who saw future value in the CPS Tools 'Brainwriting and Visual Connections.' High Developers did not see future value in the CPS Tool 'Praise First (PPCo)/ALUo/LCOb,' however Low Developers saw future value in the CPS Principle 'Be Affirmative.'

Another group of significant findings was derived from the qualitative data gathered. The first question asked the course participants what their most significant key learning was and why. It was discovered that the CPS Principle of 'Defer Judgment' was most important. This finding validates the amount of time in teaching and reinforcing this principle in the classroom. Many individuals remember that suspending ones personal judgment allows for the generation of ideas from oneself and others.

Another key finding related to the question of how they would benefit from the course personally. A number of people furnished responses that were categorized in the following two groups: 'Tools for Effective Thinking/Decision Making' and 'Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence.' Again, there was no surprise in these results because many individuals who leave the Introductory to CPS course find their problem solving abilities enhanced as well as feel their personal lives will improve especially relationships with spouses, family and friends.

The last significant discovery came from the third qualitative question. This question asked how would the individual benefit from the Introductory CPS course from a professional perspective. A majority of the individuals believed that it would be important to take what they learned and enhance their workplace. This may be through teaching others the CPS process or facilitating teams or changing the ways in which they approach and solve work related challenges.

Implications

There are a number of key implications this research could have on the teaching of CPS. One implication is how an individual interacts with the CPS process. It is important to underscore the meaningfulness of preference and how learning CPS impacts oneself. Without having knowledge of personal preference, it is difficult to understand where one benefits from learning CPS. The BCPI clearly helps in determining how one solves problems creatively, and

more importantly it puts the CPS process in a frame of context to realize how one interacts with it on a personal level.

Another implication is the need to increase the amount of time spent on teaching the third CPS Component 'Planning for Action' and its related tools. Much time and effort is placed on teaching the CPS Components 'Generating Ideas and Explore the Challenge.' Many students who exit the Introductory CPS course understand how to utilize the third CPS Component, but generally do not practice it as much in class. There is nothing wrong with a teaching emphasis being placed on the first two CPS Components and related tools, however it may be wise to look at making an adjustment in time spent in the future.

The last implication is the need for a standard, uniform CPS model. The current way CPS is being taught was a challenge this study had to deal with. It would have made it easier to use a common language of CPS for this study. Also, when students exit the Introductory CPS course, they typically continue on and learn advanced group facilitation techniques. Having a uniform language oriented CPS model would help in allowing everyone to speak the same CPS language.

Recommendations for Future Research & Replication of Current Study

In terms of suggestions for future research, there are a number of possible pathways that will be explored here. By being the first research study on the BCPI, there are many interesting conclusions brought forth that could be future research opportunities. One avenue of research, which is currently underway at the Center for Studies in Creativity, is to explore more deeply the personality traits that relate to each of the four BCPI preferences.

Another possible research endeavor would be to look at the 'skill gap phenomenon' in this study more explicitly. A smaller sample perhaps would allow for a deeper analysis of this discovery. It would be interesting to interview people to understand what aspects of the CPS process they find most useful in the future.

In terms of replicating this study, the layout of the Creative Problem Solving Course Survey should be revised. The current version categorizes the CPS Components and Stages as they are portrayed in the textbook (i.e., Veher, Firestien and Miller, 1999). The CPS Principles and Tools were also categorized in their relationship to divergent and convergent thinking. It would be recommended that an updated survey use the same overall structure, however alphabetize the sections instead.

With respect to the qualitative questions, it should be noted that when it came time to interpret the results, two CPS trained individuals were used to categorize the data. The reason behind this is that a person who is experienced in the CPS process would better understand the data presented to them versus someone with no CPS experience. It should also be noted that the categories presented in the previous chapter may change depending on the types of responses furnished.

Another suggestion for replicating this study would be to not use undergraduate students with their graduate counterparts. The reason for this is typically undergraduate students are limited in 'real-world' experience, which therefore is reflected in the quality of responses generated. The qualitative questions answered by the graduate students were insightful and provided evidence of applications for the CPS process. The use of graduate students explicitly would assist in the reduction of inferior data.

In conclusion, it is hoped that this research will serve as a foundation for understanding how individuals interact with the CPS process. The newness of the BCPI and its direct relationship with the CPS process make it a strong candidate for a unique path of research at the Center for Studies in Creativity. The importance of creativity and innovation in society is becoming ever more important. By understanding ones personal style of solving problems creatively allows an individual to become an asset in any organization. The future of CPS research clearly lies within understanding the many applications of the BCPI in our everyday lives.

Conclusion

This chapter reviewed the findings of this study. The results were presented, followed by the implications of conducting this research. Lastly, suggestions and recommendations for future research were presented.

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Appendix A

This appendix contains the qualitative results organized by category themes for Question One of the Creative Problem Solving Course Survey.

Question One Qualitative Results by Category Themes

CPS as a Structured Process

- I learned that there is a specific problem solving process. Useful in a lot of areas. Capable of many solutions.
- The process. For use personally and professionally.
- That the process can be used and started at any component.
- Using the CPS process.
- I learned to break down a problem and find a realistic, fitting, logical solution. I have learned how to apply basic problem solving methods and tools to my everyday life situations.
- Making decisions, solving problems, and sifting through a general mess does not have to be a laborious, painful experience.
- The proper order of the process. This systematic method of solving ideas is effective for most problems.
- The most important thing I learned was the structure around the CPS process. Personally, I learned some new tools.
- The CPS process including brainstorming.
- The most important thing I learned was that there is a process to utilizing your own creativity. The components of CPS are extremely useful and can be applied to a wide variety of situations.
- The structure and process of Creative Problem Solving. Most brainstorming exercises don't explain deferring judgment – convergent thinking and highlighting techniques.
- I now have a tool to implement to solve my own problems and to help others identify and find solutions for problems.

CPS as a Structured Process (cont.)

- When it's appropriate to diverge and when to converge. Critical to understand that divergent thinking is what gets you to innovation, and just because you generate an idea doesn't mean you have to implement it. Need to maintain safety in divergent thinking.
- Learning the creative process, because I can use it in my work and future career for solving problems.
- The most important thing I learned was the problem solving process. This is because it opened my eyes to new ways of solving something and giving me an original way to do it.

Deferring Judgement

- To defer judgement. So many times I look at the negative of an idea instead of looking at ways it may be positive. This course taught me to do that and it's working. I hope to pass this on to others.
- Divergent thinking and deferring judgement. I think that if these were practiced by people it would be a much different world.
- I found that learning brainstorming concepts – strive for quantity, defer judgement, etc. I'm sure those will be very helpful!
- To stretch and generate ideas until you get unique ones. At work we tend to stop too soon, I believe, and then miss out on potentially groundbreaking ideas.
- Deferring judgement for all the facts, possibilities & clarifying the problem. This is major because many times we aren't working on the correct one.
- Defer judgement – you never know what will work until you work through it.
- How to defer judgment. Because otherwise, good ideas could be stifled.
- To seek wild and unusual, and don't judge. I'm bad at jumping to conclusions and dismissing options. This helped.

Deferring Judgement (cont.)

- It has to be that you should defer judgement on all the novel and wild ideas no matter how unusual.
- To defer judgement. Knowing that no one id openly judging me I can feel more comfortable speaking out.
- The most important thing I learned was that I should carry my ideas and thoughts to another level when attempting to solve a problem instead of just finding a quick solution.
- I've learned the importance of deferring judgement, striving for quantity and in the same time the need to stay on course.
- The different tools and how to use them. Suspend judgement.
- Defer judgment – too easy dismiss other people's ideas as silly, or that they'll never work.
- To defer judgment and strive for quantity because creativity stems from novel ideas.
- To defer judgment! It is a habit I have learned to develop in order to become more creative and to allow others to feel more free to be creative.
- How to generate ideas.
- That there is no wrong answer to a challenge just not useable now. Defer my judgment – it will stop the creative flow.
- Defer judgment – need to keep my opinions out of ideas – can then really look at good/bad as a whole, and not discount that idea right away.
- Praise and defer judgment, because it is a barrier to creativity and communication.
- One of the most basic concepts – deferring judgment. It has notably made in a difference in numerous professional and personal situations.
- The most important thing I learned was to defer judgment. It applies to more than just CPS, teaches skills of listening.

Deferring Judgement (cont.)

- I learned to defer judgment and wait to make a decision until I have explored all the data and all possible options. I found the quick fix is not always the best solution.
- Defer judgment – stops political and controversial outcomes.
- Defer judgment and be affirmative – too much time is wasted with negative attitudes and criticism.
- I believed deferring judgment was the most important because it made me sit back and listen in my personal life – and has improved my relationship with my loved ones.
- Divergent thinking. The process in which how people react and now makes me more aware. Will allow me to better turn a problem around.

Dynamic Balance

- Dynamic Balance and Ladder of Abstraction. Because they are new ideas to me – most everything I heard about before.
- That you have two types of thinking – know which one you are using effectively then use other effectively.
- Upshifting and downshifting, the knowledge of these two principles alone allows me to better control them, thus being a better creator and accepting of ideas.
- Has helped me to work on problems by generating many different ideas and to choose the most important.
- The dynamic balance – to learn to use both to solve problems.

Personal Insights

- I learned how to work with others more.
- It's OK to make mistakes.
- There is no right or wrong answer.
- Everyone can be creative.

Personal Insights (cont.)

- Take responsibility for my personal creativity and be passionate about my positive, compelling future vision!

Professional Applications

- How to be a facilitator.
- How to use this stuff in my classroom.
- I will now be empowered, as an educational leader, to facilitate problem solving sessions – so my employees can become owners of the solution with my direction – but "hands off" strategies will subtly dominate my methods.

Style – Problem Solving and Defining, and Style Preference

- My preferred style in the BCPI is Ideator. That explains why generally certain activities/parts of projects are relatively less appealing & harder to tackle. With the knowledge of my preference I can apply discipline as needed to accomplish what I must.
- I learned that I am an implementor and that has helped me realize why I am frustrated with some of the people I work with who are obviously the opposite. I also learned a good foundation of the CPS process which I love and anxious to be more proficient.
- Cognitive style and impact of style on use and facilitation of CPS.
- Knowledge of myself in relation to the CPS analysis. My creative style; the ability to judge others style; the ability to look at my style as I go through it.
- I am too divergent, naturally creative but never applied or converged ideas. I would get too anxious and do not. The most important thing diverging to converging to plan for action seen as baby steps (do-able).

Tools

- The variety of tools and techniques.
- Brainwriting – Great technique – delivers excellent results, involves all learners.

Tools (cont.)

- PPCo. I have a tendency to think negatively first. This helps to correct.
- Tools application. The variety to work with.
- Tools.
- I liked the tool application.
- The tools and how to use them effectively. The facilitation was definitely the best experience and most helpful.
- VIR – a new tool to diverge with. Card sort – a way to rank ideas.
- The tools and Task Analysis. It will help me approach problems better.
- Variety – yet similarity of tools.
- The correct way of using convergent and divergent tools. There is a lot bastardization of these tools.
- The tools, because I will be able to use them in the future – school, work and personal life.
- Diversity of tools available to solve problems.
- The tools – both divergent and convergent, because they're applicable to everyday occurrences, challenges and ideas. These tools are very useful.
- How to generate ideas, because I never knew anything about forced connections, brainwriting and stick 'em up brainstorming.
- The PPCo model, because of my tendency to judge ideas, and find the 'wrongs' before the 'rights.' This helps me consider other people's ideas more.

Understanding the Problem, Clarifying, Questioning

- Clarifying the problem because if you have a clear picture of where you're going you can get there quicker.

Understanding the Problem, Clarifying, Questioning (cont.)

- Clarifying the problem and statement starters. I believe clarifying a problem "up-front" can save enormous time in solving a problem. Statement starters help to focus without limiting content too much.
- People rarely communicate the problem accurately the first time. This will give me added confidence to take the time up-front with the client (despite client's resistance) to really define the problem.
- That you have to identify what the real problem is. How to overcome by using PPCo. Often we have an idea of what a problem is…spend our time solving the wrong problem (which is often related). Once we identify the problem then we can begin to work on it and overcoming what's stopping us from doing that.
- Rephrasing the question or problem.

Miscellaneous

- How to be positive and implement ideas.
- Generating ideas – I like to think!
- That there are many ways to solve problems and everyone needs to be aware of the process dynamics.

Appendix B

This appendix contains the qualitative results organized by high and low BCPI preferences for Question One of the Creative Problem Solving Course Survey.

Question One Qualitative Results for the Four BCPI Preferences

High Clarifier

CPS as a Structured Process

- The CPS process including brainstorming.

Deferring Judgement

- That the process can be used and started at any component.
- I learned to defer judgment and wait to make a decision until I have explored all the data and all possible options. I found the quick fix is not always the best solution.
- Defer judgment and be affirmative – too much time is wasted with negative attitudes and criticism.
- I believed deferring judgment was the most important because it made me sit back and listen in my personal life – and has improved my relationship with my loved ones.
- Divergent thinking. The process in which how people react and now makes me more aware. Will allow me to better turn a problem around.

Dynamic Balance

- Upshifting and downshifting, the knowledge of these two principles alone allows me to better control them, thus being a better creator and accepting of ideas.
- Has helped me to work on problems by generating many different ideas and to choose the most important.

Personal Insights

- There is no right or wrong answer.

Low Clarifier

CPS as a Structured Process

- The process. For use personally and professionally.
- I learned to break down a problem and find a realistic, fitting, logical solution. I have learned how to apply basic problem solving methods and tools to my everyday life situations.

Deferring Judgement

- Divergent thinking and deferring judgement. I think that if these were practiced by people it would be a much different world.
- I found that learning brainstorming concepts – strive for quantity, defer judgement, etc. I'm sure those will be very helpful!
- Deferring judgement for all the facts, possibilities & clarifying the problem. This is major because many times we aren't working on the correct one.
- To seek wild and unusual, and don't judge. I'm bad at jumping to conclusions and dismissing options. This helped.
- How to generate ideas.
- The most important thing I learned was to defer judgment. It applies to more than just CPS, teaches skills of listening.

Dynamic Balance

- The dynamic balance – to learn to use both to solve problems.

Professional Applications

- How to be a facilitator.
- How to use this stuff in my classroom.

High Clarifier (cont.)	**Low Clarifier (cont.)**
Personal Insights (cont.) • Take responsibility for my personal creativity and be passionate about my positive, compelling future vision! Style – Problem Solving and Defining… • Knowledge of myself in relation to the CPS analysis. My creative style; the ability to judge others style; the ability to look at my style as I go through it. Tools • Tools application. The variety to work with. • The tools and how to use them effectively. The facilitation was definitely the best experience and most helpful. • The tools and Task Analysis. It will help me approach problems better. • Variety – yet similarity of tools. • Diversity of tools available to solve problems. Understanding the Problem… • How to generate ideas, because I never knew anything about forced connections, brainwriting and stick 'em up brainstorming. • Rephrasing the question or problem.	Style – Problem Solving and Defining… • I am too divergent, naturally creative but never applied or converged ideas. I would get too anxious and do not. The most important thing diverging to converging to plan for action seen as baby steps (do-able). Tools • The variety of tools and techniques. • VIR – a new tool to diverge with. Card sort – a way to rank ideas. • The tools – both divergent and convergent, because they're applicable to everyday occurrences, challenges and ideas. These tools are very useful. Understanding the Problem… • Clarifying the problem and statement starters. I believe clarifying a problem "up-front" can save enormous time in solving a problem. Statement starters help to focus without limiting content too much. Miscellaneous • Generating ideas – I like to think!

High Ideator	**Low Ideator**
CPS as a Structured Process • I learned that there is a specific problem solving process. Useful in a lot of areas. Capable of many solutions. • Using the CPS process. • I learned to break down a problem and find a realistic, fitting, logical solution. I have learned how to apply basic problem solving methods and tools to my everyday life situations. • The most important thing I learned was the structure around the CPS process. Personally, I learned some new tools. • I now have a tool to implement to solve my own problems and to help others identify and find solutions for problems. • The most important thing I learned was the problem solving process. This is because it opened my eyes to new ways of solving something and giving me an original way to do it. Deferring Judgement • To defer judgement. So many times I look at the negative of an idea instead of looking at ways it may be positive. This course taught me to do that and it's working. I hope to pass this on to others. • How to defer judgment. Because otherwise, good ideas could be stifled. • One of the most basic concepts – deferring judgment. It has notably made in a difference in numerous professional and personal situations. Dynamic Balance • Dynamic Balance and Ladder of Abstraction. Because they are new ideas to me – most everything I heard about before. • That you have two types of thinking – know which one you are using effectively then use other effectively.	CPS as a Structured Process • The most important thing I learned was the structure around the CPS process. Personally, I learned some new tools. • Learning the creative process, because I can use it in my work and future career for solving problems. Deferring Judgement • To defer judgement. So many times I look at the negative of an idea instead of looking at ways it may be positive. This course taught me to do that and it's working. I hope to pass this on to others. • Defer judgement – you never know what will work until you work through it. • To defer judgement. Knowing that no one id openly judging me I can feel more comfortable speaking out. • The most important thing I learned was that I should carry my ideas and thoughts to another level when attempting to solve a problem instead of just finding a quick solution. • I've learned the importance of deferring judgement, striving for quantity and in the same time the need to stay on course. • Praise and defer judgment, because it is a barrier to creativity and communication. • Divergent thinking. The process in which how people react and now makes me more aware. Will allow me to better turn a problem around. Personal Insights • It's OK to make mistakes. Style – Problem Solving and Defining… • Knowledge of myself in relation to the CPS analysis. My creative style; the ability to judge others style; the ability to look at my style as I go through it.

High Ideator (cont.)	**Low Ideator (cont.)**
Professional Applications • How to use this stuff in my classroom. Style – Problem Solving and Defining… • My preferred style in the BCPI is Ideator. That explains why generally certain activities/parts of projects are relatively less appealing & harder to tackle. With the knowledge of my preference I can apply discipline as needed to accomplish what I must. • Cognitive style and impact of style on use and facilitation of CPS. • I am too divergent, naturally creative but never applied or converged ideas. I would get too anxious and do not. The most important thing diverging to converging to plan for action seen as baby steps (do-able). Tools • The variety of tools and techniques. Understanding the Problem… • Clarifying the problem and statement starters. I believe clarifying a problem "up-front" can save enormous time in solving a problem. Statement starters help to focus without limiting content too much. • People rarely communicate the problem accurately the first time. This will give me added confidence to take the time up-front with the client (despite client's resistance) to really define the problem. Miscellaneous • How to be positive and implement ideas. • That there are many ways to solve problems and everyone needs to be aware of the process dynamics.	Tools • Tools application. The variety to work with. • The correct way of using convergent and divergent tools. There is a lot bastardization of these tools. • How to generate ideas, because I never knew anything about forced connections, brainwriting and stick 'em up brainstorming. Understanding the Problem… • Clarifying the problem because if you have a clear picture of where you're going you can get there quicker. • That you have to identify what the real problem is. How to overcome by using PPCo. Often we have an idea of what a problem is…spend our time solving the wrong problem (which is often related). Once we identify the problem then we can begin to work on it and overcoming what's stopping us from doing that.

High Developer	**Low Developer**
CPS as a Structured Process • When it's appropriate to diverge and when to converge. Critical to understand that divergent thinking is what gets you to innovation, and just because you generate an idea doesn't mean you have to implement it. Need to maintain safety in divergent thinking. Deferring Judgement • I've learned the importance of deferring judgement, striving for quantity and in the same time the need to stay on course. Tools • The tools, because I will be able to use them in the future – school, work and personal life. • The PPCo model, because of my tendency to judge ideas, and find the 'wrongs' before the 'rights.' This helps me consider other people's ideas more. Understanding the Problem… • Clarifying the problem because if you have a clear picture of where you're going you can get there quicker. • That you have to identify what the real problem is. How to overcome by using PPCo. Often we have an idea of what a problem is…spend our time solving the wrong problem (which is often related). Once we identify the problem then we can begin to work on it and overcoming what's stopping us from doing that. Miscellaneous • Generating ideas – I like to think!	CPS as a Structured Process • Using the CPS process. • Making decisions, solving problems, and sifting through a general mess does not have to be a laborious, painful experience. • The proper order of the process. This systematic method of solving ideas is effective for most problems. • The most important thing I learned was the structure around the CPS process. Personally, I learned some new tools. • The structure and process of Creative Problem Solving. Most brainstorming exercises don't explain deferring judgment – convergent thinking and highlighting techniques. • I now have a tool to implement to solve my own problems and to help others identify and find solutions for problems. • The most important thing I learned was the problem solving process. This is because it opened my eyes to new ways of solving something and giving me an original way to do it. Deferring Judgement • It has to be that you should defer judgement on all the novel and wild ideas no matter how unusual. • Defer judgment – too easy dismiss other people's ideas as silly, or that they'll never work. • To defer judgment! It is a habit I have learned to develop in order to become more creative and to allow others to feel more free to be creative. • That there is no wrong answer to a challenge just not useable now. Defer my judgment – it will stop the creative flow. Dynamic Balance • That you have two types of thinking – know which one you are using effectively then use other effectively.

	Low Developer (cont.) Dynamic Balance (cont.) • Has helped me to work on problems by generating many different ideas and to choose the most important. Personal Insights • I learned how to work with others more. • Everyone can be creative. Professional Applications • I will now be empowered, as an educational leader, to facilitate problem solving sessions – so my employees can become owners of the solution with my direction – but "hands off" strategies will subtly dominate my methods. Style – Problem Solving and Defining… • I learned that I am an implementor and that has helped me realize why I am frustrated with some of the people I work with who are obviously the opposite. I also learned a good foundation of the CPS process which I love and anxious to be more proficient. • Cognitive style and impact of style on use and facilitation of CPS. Tools • Tools. • I liked the tool application. • The tools and Task Analysis. It will help me approach problems better. Miscellaneous • That there are many ways to solve problems and everyone needs to be aware of the process dynamics.

High Implementor	**Low Implementor**
CPS as a Structured Process • The process. For use personally and professionally. • Making decisions, solving problems, and sifting through a general mess does not have to be a laborious, painful experience. • The proper order of the process. This systematic method of solving ideas is effective for most problems. • The most important thing I learned was that there is a process to utilizing your own creativity. The components of CPS are extremely useful and can be applied to a wide variety of situations. • The structure and process of Creative Problem Solving. Most brainstorming exercises don't explain deferring judgment – convergent thinking and highlighting techniques. • Learning the creative process, because I can use it in my work and future career for solving problems. Deferring Judgement • I found that learning brainstorming concepts – strive for quantity, defer judgement, etc. I'm sure those will be very helpful! • To stretch and generate ideas until you get unique ones. At work we tend to stop too soon, I believe, and then miss out on potentially groundbreaking ideas. • Deferring judgement for all the facts, possibilities & clarifying the problem. This is major because many times we aren't working on the correct one. • To seek wild and unusual, and don't judge. I'm bad at jumping to conclusions and dismissing options. This helped. • It has to be that you should defer judgement on all the novel and wild ideas no matter how unusual.	CPS as a Structured Process • That the process can be used and started at any component. • When it's appropriate to diverge and when to converge. Critical to understand that divergent thinking is what gets you to innovation, and just because you generate an idea doesn't mean you have to implement it. Need to maintain safety in divergent thinking. Deferring Judgement • How to defer judgment. Because otherwise, good ideas could be stifled. • The different tools and how to use them. Suspend judgement. • One of the most basic concepts – deferring judgment. It has notably made in a difference in numerous professional and personal situations. • I learned to defer judgment and wait to make a decision until I have explored all the data and all possible options. I found the quick fix is not always the best solution. • Defer judgment and be affirmative – too much time is wasted with negative attitudes and criticism. • I believed deferring judgment was the most important because it made me sit back and listen in my personal life – and has improved my relationship with my loved ones. Personal Insights • There is no right or wrong answer. • Take responsibility for my personal creativity and be passionate about my positive, compelling future vision!

High Implementor (cont.)	**Low Implementor (cont.)**
Deferring Judgement (cont.) • The most important thing I learned was that I should carry my ideas and thoughts to another level when attempting to solve a problem instead of just finding a quick solution. • Defer judgment – too easy dismiss other people's ideas as silly, or that they'll never work. • To defer judgment and strive for quantity because creativity stems from novel ideas. • To defer judgment! It is a habit I have learned to develop in order to become more creative and to allow others to feel more free to be creative. • How to generate ideas. • That there is no wrong answer to a challenge just not useable now. Defer my judgment – it will stop the creative flow. • Defer judgment – need to keep my opinions out of ideas – can then really look at good/bad as a whole, and not discount that idea right away. • Praise and defer judgment, because it is a barrier to creativity and communication. • The most important thing I learned was to defer judgment. It applies to more than just CPS, teaches skills of listening. • Defer judgment – stops political and controversial outcomes. Dynamic Balance • The dynamic balance – to learn to use both to solve problems. Personal Insights • It's OK to make mistakes. • Everyone can be creative. Professional Applications • How to be a facilitator.	Style – Problem Solving and Defining… • My preferred style in the BCPI is Ideator. That explains why generally certain activities/parts of projects are relatively less appealing & harder to tackle. With the knowledge of my preference I can apply discipline as needed to accomplish what I must. Tools • PPCo. I have a tendency to think negatively first. This helps to correct. • The tools and how to use them effectively. The facilitation was definitely the best experience and most helpful. • Variety – yet similarity of tools. • The tools, because I will be able to use them in the future – school, work and personal life. • Diversity of tools available to solve problems. • The PPCo model, because of my tendency to judge ideas, and find the 'wrongs' before the 'rights.' This helps me consider other people's ideas more. Understanding the Problem… • Rephrasing the question or problem. Miscellaneous • How to be positive and implement ideas.

High Implementor (cont.)	
Style – Problem Solving and Defining… • I learned that I am an implementor and that has helped me realize why I am frustrated with some of the people I work with who are obviously the opposite. I also learned a good foundation of the CPS process which I love and anxious to be more proficient. Tools • Brainwriting – Great technique – delivers excellent results, involves all learners. • Tools. • I liked the tool application. • VIR – a new tool to diverge with. Card sort – a way to rank ideas. • The tools – both divergent and convergent, because they're applicable to everyday occurrences, challenges and ideas. These tools are very useful.	

Appendix C

This appendix contains the qualitative results organized by category themes for Question Two of the Creative Problem Solving Course Survey.

Question Two Qualitative Results by Category Themes

Change in Attitude Towards Others

- Provided an opportunity to assess my own habits as well as the means to change and value many perspectives and ideas.
- Personally, I know my place in the CPS process as a budding administrator. This will decrease the pressure and spotlight that is placed upon me – but help others to become empowered with their solution to problems.

Defer Judgement

- Again to defer judgement and to always be as creative as possible.
- Personally, I am learning to defer judgement, which is a plus in problem-solving.
- Deferring judgement – that way I won't "jump" to conclusions automatically.
- Defer judgment with my family as well as my work environment.
- Will help with family conflicts. Helps me defer judgment.
- To defer judgment and plan for action.
- I'll led people talk (defer judgment) before I open my mouth.
- I have learned to defer judgment in my personal life.
- This class has taught me to defer judgment which will benefit my relationships with friends and family.
- I will defer judgment when interacting with friends and family. Will volunteer pluses and potentials of ideas people have. Will stretch to solve personal problems that may have felt impossible before.

Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence

- I feel like I can use this process myself to solve any number of personal & professional problems. The process helps me take a needed step back from emotional aspects of problem solving.

Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (cont.)

- More confident in challenging situations.
- The material taught in this class, when responsibly applied, can transform positively the lives of those who use it. I will use many of the concepts every day (& do now) & will use the workshop to challenges I encounter.
- Heightened self-awareness.
- Again, a more positive, affirmative outlook in the face of challenges. I see more opportunities and fewer problems.
- I have already used it in my personal life, and I plan to use it in the classroom when I begin teaching.
- I plan to use CPS for personal challenges.
- I can now look at problems and challenges in new and different ways.
- I'm better prepared to be a leader and also to handle problems in the future.
- Reinforces previous learning (VIR – a new tool to diverge with; Card sort – a way to rank ideas). Very useful with self-actualization skills as well as working with/or within groups. Provides me more options, opportunities and possibilities to help solve my own or another's problem.
- It already has. I've approached becoming more creative by looking at the 12 areas and choosing which areas I need to focus on. The change in my life has been dramatic in becoming more "healthy" which is the area I worked on.
- I will/am attempting to internalize one heuristic at a time to incorporate into my daily life. Remain curious and have fun are the two I am presently focused on.
- All of a sudden you start to look at things differently.
- This course will benefit me personally by providing me with an objective process that I can follow to solve problems that I may be to emotionally tied to.

Personal Growth/Self-Actualization/Change in Self-Image/Increased Confidence (cont.)

- Opened my mind to things and processes I have forgotten.
- I learned a lot about myself.
- I can use CPS techniques to improve the quality of my life and my relationships. It helps give me a different perspective on things.
- I will be more creative in my personal life.
- I am more aware of ideas and trying to keep a positive attitude. Knowing that mistakes are yield signs and not stop signs. Sense of humor is so important also.
- It has benefited me by allowing me to absorb more of the people I live with thoughts and emotions. Have improved my relationship with my boyfriend.
- I don't think I'll look at problems the same way.
- It will enable me to strive for those goals and to just do the actions – better mental awareness.
- Personal problems – things that come up in my life – financial, family, school, etc.

Tools for Effective Thinking/Decision Making

- Allow me to solve problems and/or come up with more creative approaches to make life more interesting.
- Well, again clarifying the problem and checking for ownership. Many times we try and change things – put in great effort and it's really not our problem.
- This course has provided a process that will expedite my decision making in various situations.
- Pluses, Potentials, Concerns
- Help with decision making, following through, feeling positive and not trapped.
- Overcoming limitations to problems and generating more options for problems.

Tools for Effective Thinking/Decision Making (cont.)

- I have not only learned the process, but I've learned tools that many times stand by themselves.
- I have a different mind set now that helps me think of ways to generate ideas more effectively.
- Helped solve personal problem.
- This will help with the decisions I make. All the way from what clothes to buy to who to marry. It makes me look at my decision-making techniques in a whole new way.
- I can apply many of the tools into my daily thought process.
- The tools and Task Analysis. It will help me approach problems better.
- I intend to use this for a committee I'm on. We need new ideas for a problem we are dealing with.
- Provides alternative methods in approaching challenges in my career and life.
- I will benefit personally by applying these tools to my daily challenges.
- It will allow me to analyze my problems from a different perspective. The idea of identifying a problem and developing a plan for action is useful to me.
- When problems occur I will have the tools necessary to solve them.
- It will help me see (1) which problems I truly have ownership of and (2) how to develop a plan for action.
- I think the course contained so many concepts that when you learn them it's almost like the proverbial light bulb goes off – they're very logical. Therefore, I feel they're easy to apply to everyday situations and can be very enriching.
- It will help me see problems in different ways.
- Greatly increased awareness (and motivation to) defer judgment and the tools to be active in making dreams/wishes/goals/challenges come to fruition.

Tools for Effective Thinking/Decision Making (cont.)

- I work with teachers all day. So I can be professional and objective when looking at how to improve strategies and grades.
- The idea system and idea generating stage will help me stay creative when approaching various problems and/or solutions.
- It gave me an understanding on how to reflect and to think out-of-the-box. It will help expand my overall creative problem solving techniques.

Understanding Cognitive Style/Style of Creativity

- Tremendously, developing a new style at solving challenges.
- In my search for employment (that which relates to my style).
- I will strive to increase my awareness of others learning styles. I will utilize various models within my classroom, as well as share with my colleagues. In making personal decisions.
- Yes – the KAI was interesting and explained aspects of my style of creativity.
- It will benefit me because I am aware of different creative styles. I can flex. When working with others. Deferring judgement/affirmative judgement will help me when I come up with ideas for problem solving.
- Knowledge of myself in relation to the CPS analysis. My creative style; the ability to judge others style; the ability to look at my style as I go through it. The ability to use these processes and tools in job, personal life.

Use of a Deliberate Process

- It provides me with an incredibly powerful tool to use in my business environment, as well as in making personal and career decisions.
- It will help me organize and plan my goals more effectively.
- I hope to keep learning and practicing the CPS process until I am comfortable using it in all aspects of my life.

Use of a Deliberate Process (cont.)

- Shows me how to solve my problems more creatively.
- I think I can help myself and others problem solve more.
- As an alternative way to solve problems.
- I have a better grasp on how to solve a problem without giving up. I can create more novel ideas to solve dilemmas.
- Applications to personal choices as opposed to "einy-meanie-miney-moe."
- Keeping the CPS principles in mind. In the future problems will help me see them as possible.
- Assist in providing tools to clarify and solve goals, wishes and challenges, personally.
- Have a systematic approach to the problem solving process. Know that there is more than one solution to each problem and be able to deal with minor and major problems in my life in a more thorough thought out way.
- I am currently learning the Six Sigma methodology – this program parallels the same path – divergent, convergent process.
- I can use it to be able to put my ideas into action.
- Help me to utilize creativity by being able to converge idea and create a plan.

Miscellaneous

- So I can look to things positively and follow through with plans.
- Gives me great ideas!
- I regret I have not been here a lot of years ago. Anywhere I feel we changed.
- In my classroom and with personal problems.

Appendix D

This appendix contains the qualitative results organized by high and low BCPI preferences for Question Two of the Creative Problem Solving Course Survey.

Question Two Qualitative Results for the Four BCPI Preferences

High Clarifier

Defer Judgement

- Will help with family conflicts. Helps me defer judgment.
- I'll led people talk (defer judgment) before I open my mouth.

Personal Growth/Self-Actualization/…

- I learned a lot about myself.
- I can use CPS techniques to improve the quality of my life and my relationships. It helps give me a different perspective on things.
- I am more aware of ideas and trying to keep a positive attitude. Knowing that mistakes are yield signs and not stop signs. Sense of humor is so important also.
- It has benefited me by allowing me to absorb more of the people I live with thoughts and emotions. Have improved my relationship with my boyfriend.
- It will enable me to strive for those goals and to just do the actions – better mental awareness.
- Personal problems – things that come up in my life – financial, family, school, etc.

Tools for Effective Thinking/ Decision …

- I have not only learned the process, but I've learned tools that many times stand by themselves.
- I have a different mind set now that helps me think of ways to generate ideas more effectively.
- The tools and Task Analysis. It will help me approach problems better.
- I intend to use this for a committee I'm on. We need new ideas for a problem we are dealing with.

Low Clarifier

Defer Judgement

- Deferring judgement – that way I won't "jump" to conclusions automatically.
- To defer judgment and plan for action.
- This class has taught me to defer judgment which will benefit my relationships with friends and family.

Personal Growth/Self-Actualization/…

- More confident in challenging situations.
- Heightened self-awareness.
- I'm better prepared to be a leader and also to handle problems in the future.
- Reinforces previous learning (VIR – a new tool to diverge with; Card sort – a way to rank ideas). Very useful with self-actualization skills as well as working with/or within groups. Provides me more options, opportunities and possibilities to help solve my own or another's problem.

Tools for Effective Thinking/ Decision …

- Well, again clarifying the problem and checking for ownership. Many times we try and change things – put in great effort and it's really not our problem.
- Help with decision making, following through, feeling positive and not trapped.
- I will benefit personally by applying these tools to my daily challenges.

Use of a Deliberate Process

- It provides me with an incredibly powerful tool to use in my business environment, as well as in making personal and career decisions.
- Shows me how to solve my problems more creatively.

High Clarifier (cont.)	**Low Clarifier (cont.)**
Tools for Effective Thinking/… (cont.) • Provides alternative methods in approaching challenges in my career and life. • It will allow me to analyze my problems from a different perspective. The idea of identifying a problem and developing a plan for action is useful to me. • It will help me see problems in different ways. • Greatly increased awareness (and motivation to) defer judgment and the tools to be active in making dreams/wishes/goals/challenges come to fruition. Understanding Cognitive Style/… • Tremendously, developing a new style at solving challenges. • Knowledge of myself in relation to the CPS analysis. My creative style; the ability to judge others style; the ability to look at my style as I go through it. The ability to use these processes and tools in job, personal life. Use of a Deliberate Process • Applications to personal choices as opposed to "einy-meanie-miney-moe."	Use of a Deliberate Process (cont.) • I have a better grasp on how to solve a problem without giving up. I can create more novel ideas to solve dilemmas. • I can use it to be able to put my ideas into action. • Help me to utilize creativity by being able to converge idea and create a plan. Miscellaneous • Gives me great ideas! • In my classroom and with personal problems.

High Ideator	**Low Ideator**
Change in Attitude Towards Others • Personally, I know my place in the CPS process as a budding administrator. This will decrease the pressure and spotlight that is placed upon me – but help others to become empowered with their solution to problems. Personal Growth/Self-Actualization/… • I feel like I can use this process myself to solve any number of personal & professional problems. The process helps me take a needed step back from emotional aspects of problem solving. • More confident in challenging situations. • The material taught in this class, when responsibly applied, can transform positively the lives of those who use it. I will use many of the concepts every day (& do now) & will use the workshop to challenges I encounter. • Heightened self-awareness. • I can now look at problems and challenges in new and different ways. • I will/am attempting to internalize one heuristic at a time to incorporate into my daily life. Remain curious and have fun are the two I am presently focused on. • All of a sudden you start to look at things differently. • I don't think I'll look at problems the same way. Tools for Effective Thinking/ Decision … • This course has provided a process that will expedite my decision making in various situations. • Helped solve personal problem. • I think the course contained so many concepts that when you learn them it's almost like the proverbial light bulb goes off – they're very logical. Therefore, I feel they're easy to apply to everyday situations and can be very enriching.	Change in Attitude Towards Others • Provided an opportunity to assess my own habits as well as the means to change and value many perspectives and ideas. Defer Judgement • Again to defer judgement and to always be as creative as possible. • Personally, I am learning to defer judgement, which is a plus in problem-solving. Personal Growth/Self-Actualization/… • I have already used it in my personal life, and I plan to use it in the classroom when I begin teaching. • It already has. I've approached becoming more creative by looking at the 12 areas and choosing which areas I need to focus on. The change in my life has been dramatic in becoming more "healthy" which is the area I worked on. • It will enable me to strive for those goals and to just do the actions – better mental awareness. Tools for Effective Thinking/ Decision … • I can apply many of the tools into my daily thought process. • It will allow me to analyze my problems from a different perspective. The idea of identifying a problem and developing a plan for action is useful to me. • It gave me an understanding on how to reflect and to think out-of-the-box. It will help expand my overall creative problem solving techniques. Understanding Cognitive Style/… • Tremendously, developing a new style at solving challenges.

High Ideator (cont.)	**Low Ideator (cont.)**
Tools for Effective Thinking/… (cont.) • I work with teachers all day. So I can be professional and objective when looking at how to improve strategies and grades. • The idea system and idea generating stage will help me stay creative when approaching various problems and/or solutions. Understanding Cognitive Style/… • In my search for employment (that which relates to my style). Use of a Deliberate Process • It provides me with an incredibly powerful tool to use in my business environment, as well as in making personal and career decisions. • It will help me organize and plan my goals more effectively. • I have a better grasp on how to solve a problem without giving up. I can create more novel ideas to solve dilemmas. • Help me to utilize creativity by being able to converge idea and create a plan. Miscellaneous • So I can look to things positively and follow through with plans. • In my classroom and with personal problems.	Understanding Cognitive Style/… (cont.) • Yes – the KAI was interesting and explained aspects of my style of creativity. • Knowledge of myself in relation to the CPS analysis. My creative style; the ability to judge others style; the ability to look at my style as I go through it. The ability to use these processes and tools in job, personal life. Use of a Deliberate Process • As an alternative way to solve problems. Miscellaneous • I regret I have not been here a lot of years ago. Anywhere I feel we changed.

High Developer	**Low Developer**
Defer Judgement • Personally, I am learning to defer judgement, which is a plus in problem-solving. • I will defer judgment when interacting with friends and family. Will volunteer pluses and potentials of ideas people have. Will stretch to solve personal problems that may have felt impossible before. Personal Growth/Self-Actualization/… • It already has. I've approached becoming more creative by looking at the 12 areas and choosing which areas I need to focus on. The change in my life has been dramatic in becoming more "healthy" which is the area I worked on. Understanding Cognitive Style/… • It will benefit me because I am aware of different creative styles. I can flex. When working with others. Deferring judgement/affirmative judgement will help me when I come up with ideas for problem solving. Use of a Deliberate Process • Keeping the CPS principles in mind. In the future problems will help me see them as possible. Miscellaneous • Gives me great ideas! • I regret I have not been here a lot of years ago. Anywhere I feel we changed.	Change in Attitude Towards Others • Personally, I know my place in the CPS process as a budding administrator. This will decrease the pressure and spotlight that is placed upon me – but help others to become empowered with their solution to problems. Defer Judgement • Defer judgment with my family as well as my work environment. • I have learned to defer judgment in my personal life. Personal Growth/Self-Actualization/… • I plan to use CPS for personal challenges. • I will/am attempting to internalize one heuristic at a time to incorporate into my daily life. Remain curious and have fun are the two I am presently focused on. • All of a sudden you start to look at things differently. • Opened my mind to things and processes I have forgotten. • I will be more creative in my personal life. • I don't think I'll look at problems the same way. Tools for Effective Thinking/ Decision … • Overcoming limitations to problems and generating more options for problems. • Helped solve personal problem. • This will help with the decisions I make. All the way from what clothes to buy to who to marry. It makes me look at my decision-making techniques in a whole new way. • The tools and Task Analysis. It will help me approach problems better. • When problems occur I will have the tools necessary to solve them.

	Low Developer
	Tools for Effective Thinking/… (cont.) • It will help me see (1) which problems I truly have ownership of and (2) how to develop a plan for action. • It will help me see problems in different ways. • I work with teachers all day. So I can be professional and objective when looking at how to improve strategies and grades. • The idea system and idea generating stage will help me stay creative when approaching various problems and/or solutions. Understanding Cognitive Style/… • In my search for employment (that which relates to my style). • I will strive to increase my awareness of others learning styles. I will utilize various models within my classroom, as well as share with my colleagues. In making personal decisions. Use of a Deliberate Process • I think I can help myself and others problem solve more. • Assist in providing tools to clarify and solve goals, wishes and challenges, personally.

High Implementor	**Low Implementor**
Change in Attitude Towards Others • Provided an opportunity to assess my own habits as well as the means to change and value many perspectives and ideas. Defer Judgement • Deferring judgement – that way I won't "jump" to conclusions automatically. • Defer judgment with my family as well as my work environment. • To defer judgment and plan for action. • I have learned to defer judgment in my personal life. • This class has taught me to defer judgment which will benefit my relationships with friends and family. Personal Growth/Self-Actualization/… • I plan to use CPS for personal challenges. • I'm better prepared to be a leader and also to handle problems in the future. • Reinforces previous learning (VIR – a new tool to diverge with; Card sort – a way to rank ideas). Very useful with self-actualization skills as well as working with/or within groups. Provides me more options, opportunities and possibilities to help solve my own or another's problem. • This course will benefit me personally by providing me with an objective process that I can follow to solve problems that I may be to emotionally tied to. • Opened my mind to things and processes I have forgotten. • I will be more creative in my personal life. Tools for Effective Thinking/ Decision … • Allow me to solve problems and/or come up with more creative approaches to make life more interesting. • Well, again clarifying the problem and checking for ownership. Many times we try and change things – put in great effort and it's really not our problem.	Defer Judgement • I will defer judgment when interacting with friends and family. Will volunteer pluses and potentials of ideas people have. Will stretch to solve personal problems that may have felt impossible before. Personal Growth/Self-Actualization/… • The material taught in this class, when responsibly applied, can transform positively the lives of those who use it. I will use many of the concepts every day (& do now) & will use the workshop to challenges I encounter. • Again, a more positive, affirmative outlook in the face of challenges. I see more opportunities and fewer problems. • I can now look at problems and challenges in new and different ways. • I learned a lot about myself. • I can use CPS techniques to improve the quality of my life and my relationships. It helps give me a different perspective on things. • I am more aware of ideas and trying to keep a positive attitude. Knowing that mistakes are yield signs and not stop signs. Sense of humor is so important also. • It has benefited me by allowing me to absorb more of the people I live with thoughts and emotions. Have improved my relationship with my boyfriend. • Personal problems – things that come up in my life – financial, family, school, etc. Tools for Effective Thinking/ Decision … • I have not only learned the process, but I've learned tools that many times stand by themselves. • I have a different mind set now that helps me think of ways to generate ideas more effectively. • Helped solve personal problem.

High Implementor (cont.)	**Low Implementor (cont.)**
Tools for Effective Thinking/… (cont.) • Pluses, Potentials, Concerns • Help with decision making, following through, feeling positive and not trapped. • Overcoming limitations to problems and generating more options for problems. • This will help with the decisions I make. All the way from what clothes to buy to who to marry. It makes me look at my decision-making techniques in a whole new way. • I can apply many of the tools into my daily thought process. • I will benefit personally by applying these tools to my daily challenges. • When problems occur I will have the tools necessary to solve them. • It will help me see (1) which problems I truly have ownership of and (2) how to develop a plan for action. • It gave me an understanding on how to reflect and to think out-of-the-box. It will help expand my overall creative problem solving techniques. Understanding Cognitive Style/… • I will strive to increase my awareness of others learning styles. I will utilize various models within my classroom, as well as share with my colleagues. In making personal decisions. Use of a Deliberate Process • I hope to keep learning and practicing the CPS process until I am comfortable using it in all aspects of my life. • Shows me how to solve my problems more creatively. • Assist in providing tools to clarify and solve goals, wishes and challenges, personally.	Tools for Effective Thinking/… (cont.) • I intend to use this for a committee I'm on. We need new ideas for a problem we are dealing with. • Provides alternative methods in approaching challenges in my career and life. • I think the course contained so many concepts that when you learn them it's almost like the proverbial light bulb goes off – they're very logical. Therefore, I feel they're easy to apply to everyday situations and can be very enriching. • Greatly increased awareness (and motivation to) defer judgment and the tools to be active in making dreams/wishes/goals/challenges come to fruition. Understanding Cognitive Style/… • It will benefit me because I am aware of different creative styles. I can flex. When working with others. Deferring judgement/affirmative judgement will help me when I come up with ideas for problem solving. Use of a Deliberate Process • Applications to personal choices as opposed to "einy-meanie-miney-moe." • Keeping the CPS principles in mind. In the future problems will help me see them as possible. Miscellaneous • So I can look to things positively and follow through with plans.

High Implementor (cont.)	
Use of a Deliberate Process (cont.) • Have a systematic approach to the problem solving process. Know that there is more than one solution to each problem and be able to deal with minor and major problems in my life in a more thorough thought out way. • I am currently learning the Six Sigma methodology – this program parallels the same path – divergent, convergent process. • I can use it to be able to put my ideas into action.	

Appendix E

This appendix contains the qualitative results organized by category themes for Question Three of the Creative Problem Solving Course Survey.

Question Three Qualitative Results by Category Themes

Application of Tools

- I think these are great tools to know because I personally think they are very effective in a business setting. I feel it may be able to help my family's business as well as advertising needs.
- I have new found tools which will enable me to be more productive.
- It gave me many tools to use to take a proactive stance on tricky, stressful issues and it gave me tools to think big and look (more) objectively at challenges.

Deferring Judgement

- Deferring judgement – that way I won't "jump" to conclusions automatically. In teaching and practicing conflict resolution techniques. I see a lot of applications there.
- Defer judgment and make sure you are solving the right problem.
- To be open to ideas.
- Same as #2. I'll be more accepting at others right to speak before I open my mouth and judge.
- Again I return to deferring judgment – it's amazing how conversations and professional dealings grow when one just pauses for a moment and listens.
- I will be able to defer judgment and help others do the same.

Educational/Classroom Settings

- I will take the wonderful ideas I learned in this class and pass them on to students and teachers I currently work with.
- To develop a CPS course in my high school.
- I feel it will greatly help with classroom management.
- I plan to integrate tool usage into school curriculum.
- I can apply the tools into my daily classroom activities.

Educational/Classroom Settings (cont.)

- Allows me the opportunity to apply it to my classroom as well as to help create lessons to increase cognitive learning.
- Working towards certificate in educational leadership. Applications of CPS in classroom situations.
- I will strive to increase my awareness of others learning styles. I will utilize various models within my classroom, as well as share with my colleagues. In making personal decisions. I will be asked for input and be able to offer more knowledgeable and varied answers and suggestions.
- It provided alternative methods (tools) which I can use in the classroom (my classroom).
- A whole lot! As I am a teacher and hopefully future researcher I will use these techniques in teaching, researching, etc., in the future.
- Professionally, CPS is an excellent tool that an educational leader can use. It provides for teamwork and collaboration which many schools today unfortunately do not have enough of.
- Use in my middle school classroom with children to have a more structured way to a creative learning environment. Will be deferring judgment more.
- As a teacher I feel I am on the verge of a major breakthrough. I want to find ways to use more kinesthetic learning device in class and also find ways to make class more fun and compelling for the kids.
- Help me bring out the creativity of more creative art students, who don't think creativity is learnable.

Enhancing/Improving Professional Setting

- As yet not sure. For my own business this is an avenue to explore for company set-up and identification of goals, etc.
- Professionally, I will be more comfortable working with people who have different styles than me and trust that I can leverage my abilities and those of others to produce better results.
- As a professional, I will be able to deal with different issues, persons at the same time, help them in whatever necessary it could be.
- Day to day applications for organizational skills, and revising policies and procedures.
- To organize and think of a whole company instead of just me. To think of new ideas for teaching.
- I'm a business major, one day I plan on being a manager. I really believe that creativity belongs in the workplace.
- In my future and my job now I try to relate my learnings to it.
- It will allow me to prioritize what is important to me. I can take the CPS process to my boss to look at different ways of running the company more efficiently.
- I think it will give me an edge over my co-workers at Disney. I will move up faster because I can make things work that they can't get past.
- I am more relaxed and contribute more novel ideas. I may have better solutions and better support from my co-workers.
- This course has and will benefit me professionally because and have (will) use(d) it in my writing group and with the faculty.
- My field of study is public relations and during the course of my practice, creative problem solving will come into play.
- Assist in providing tools to clarify and solve goals, wishes and challenges, professionally.

Enhancing/Improving Professional Setting (cont.)

- Many times a CPS experience is what my coworkers would benefit from.
- I will be more creative in my professional life.
- I hope I will have success above and others will take note of the fact that I have a unique way of getting to problem and helping in solution.
- I will try to nurture creativity in the work environment and pay closer attention to my comments/ideas. Try to keep it fun.
- As a future school leader it will be imperative that I establish a creative environment for problem solving and change for improving my school. Being familiar with CPS will make my job easier and more successful.
- It has given me great ideas on organization of my time and thought process that is essential in my professional career.
- I can use it with clients in therapeutic setting.
- I believe it will make my job much easier to perform.

Facilitation (As A Career/Job)

- I will become a better facilitator.
- Proper facilitation technique. I facilitate a lot and this honed my skills.
- Too many ways to count. I facilitate so I learned, tools, techniques and theory I can pass along to others.
- Yes – it will benefit. I will use the tools in facilitating. Sometimes, I may even use the CPS process.
- It will make me a better trainer. I how have more tools in my toolbox.
- I am now a better facilitator.
- Seek different ways in how to approach problems in work and may continue with some facilitation experiences.

Leadership Development

- Useful in management and leadership. I think CPS will greatly improve chances of career advancement.
- I'm better prepared to be a leader and also to handle problems in the future.
- It may lead tome showing more leadership at work as well as self-assessment in my decision making.
- Once I learn how to be creative – now I know the process I can begin to ask…LEAD others to be.
- In terms of leadership, recognize my personal responsibility for my own creativity and the environment and create – so that I can improve the climate for creativity and productivity.
- It has taught me how to be a good leader and the value of being prepared. The skills I learned have made me a more valuable employee.
- I have tools to use for different needs as a team leader. Use PPCs as a leader. Reflect on whether we're solving the right problem or need to clarify it further.

Personal Improvements

- This course has given me a more positive outlook on problem-solving.
- To have greater understanding of one self personally enhances professional identity & competence. The tools & material from the class can further be applied to professional challenges.
- Clarifying the problem and strengthening solutions – praise 1st – many times people shoot down ideas before even trying them or really even understanding them.
- I hope to keep learning and practicing the CPS process until I am comfortable using it in all aspects of my life.
- I can now look at problems and challenges in new and different ways.
- Know how to solve my own and other peoples' problems.

Personal Improvements (cont.)

- It will enable me to solve problems at my job.
- Seeking situations that relate to my style. Avoiding those which conflict with my personal style.
- I will be better equipped to solve problems as they arise.
- Better way to generate ideas for solving problems. I don't always have to be the expert!
- I will be able to share the process and help others solve their problems.
- Deal with challenges more objectively.
- It will help me become more understanding of the different problems and in life. Has helped me to deal with problems better.
- It will help me to advance and gives me a proven program that can be applied in any circumstances which will help advance my problem solving ability.

Problem Solving In A Group Setting

- This course will help with my research efforts at work and in group problem solving sessions that I often encounter at work.
- It will improve my group work and especially facilitating problems and challenges.
- Will run problem-solving sessions in a different way. Have more confidence. Have knowledge base and terminology for credibility.
- It will help to continue my team building strategies.
- Group work will be easier. Problem solving for tasks – where to begin, etc.
- It will help resolve personal conflicts among individuals.
- I will use the CPS process when I am an administrator! For sure! Yes, I will use it as a teacher, now, but it can be even more powerful when I am leaving a group of professionals.
- I work with a team so it can benefit using on problem we work to solve or help each other. Future jobs as well wherever I go to work.

Miscellaneous

- Don't know!
- Not a lot of people have the knowledge and experience of CPS.
- I'm retiring.
- Hopefully the next job I get will require me to use it.

Appendix F

This appendix contains the qualitative results organized by high and low BCPI preferences for Question Three of the Creative Problem Solving Course Survey.

Question Three Qualitative Results for the Four BCPI Preferences

High Clarifier

Application of Tools

- I think these are great tools to know because I personally think they are very effective in a business setting. I feel it may be able to help my family's business as well as advertising needs.
- I have new found tools which will enable me to be more productive.
- It gave me many tools to use to take a proactive stance on tricky, stressful issues and it gave me tools to think big and look (more) objectively at challenges.

Deferring Judgement

- Same as #2. I'll be more accepting at others right to speak before I open my mouth and judge.

Educational/Classroom Settings

- Working towards certificate in educational leadership. Applications of CPS in classroom situations.
- It provided alternative methods (tools) which I can use in the classroom (my classroom).
- As a teacher I feel I am on the verge of a major breakthrough. I want to find ways to use more kinesthetic learning device in class and also find ways to make class more fun and compelling for the kids.

Enhancing/Improving Professional Setting

- As a professional, I will be able to deal with different issues, persons at the same time, help them in whatever necessary it could be.

Low Clarifier

Deferring Judgement

- Deferring judgement – that way I won't "jump" to conclusions automatically. In teaching and practicing conflict resolution techniques. I see a lot of applications there.
- To be open to ideas.

Educational/Classroom Settings

- To develop a CPS course in my high school.
- Allows me the opportunity to apply it to my classroom as well as to help create lessons to increase cognitive learning.
- Help me bring out the creativity of more creative art students, who don't think creativity is learnable.

Enhancing/Improving Professional Setting

- I'm a business major, one day I plan on being a manager. I really believe that creativity belongs in the workplace.
- I am more relaxed and contribute more novel ideas. I may have better solutions and better support from my co-workers.
- This course has and will benefit me professionally because and have (will) use(d) it in my writing group and with the faculty.
- I can use it with clients in therapeutic setting.

Facilitation (As a Career/Job)

- I will become a better facilitator.

High Clarifier (cont.)	**Low Clarifier (cont.)**
Enhancing/Improving Professional…(cont.) • I think it will give me an edge over my co-workers at Disney. I will move up faster because I can make things work that they can't get past. • My field of study is public relations and during the course of my practice, creative problem solving will come into play. • I will try to nurture creativity in the work environment and pay closer attention to my comments/ideas. Try to keep it fun. • It has given me great ideas on organization of my time and thought process that is essential in my professional career. Facilitation (As a Career/Job) • Seek different ways in how to approach problems in work and may continue with some facilitation experiences. Leadership Development • It may lead tome showing more leadership at work as well as self-assessment in my decision making. Personal Improvements • It will help me become more understanding of the different problems and in life. Has helped me to deal with problems better. Problem Solving In A Group Setting • It will help to continue my team building strategies. • It will help resolve personal conflicts among individuals. • I work with a team so it can benefit using on problem we work to solve or help each other. Future jobs as well wherever I go to work.	Leadership Development • I'm better prepared to be a leader and also to handle problems in the future. • It has taught me how to be a good leader and the value of being prepared. The skills I learned have made me a more valuable employee. Personal Improvements • Clarifying the problem and strengthening solutions – praise 1st – many times people shoot down ideas before even trying them or really even understanding them. • I will be better equipped to solve problems as they arise. Problem Solving In A Group Setting • This course will help with my research efforts at work and in group problem solving sessions that I often encounter at work. • Will run problem-solving sessions in a different way. Have more confidence. Have knowledge base and terminology for credibility. Miscellaneous • Don't know!

High Clarifier (cont.)	
Miscellaneous • Hopefully the next job I get will require me to use it.	

High Ideator	**Low Ideator**
Deferring Judgement • Defer judgment and make sure you are solving the right problem. • Again I return to deferring judgment – it's amazing how conversations and professional dealings grow when one just pauses for a moment and listens. Educational/Classroom Settings • To develop a CPS course in my high school. • Help me bring out the creativity of more creative art students, who don't think creativity is learnable. Enhancing/Improving Professional Setting • As yet not sure. For my own business this is an avenue to explore for company set-up and identification of goals, etc. • Professionally, I will be more comfortable working with people who have different styles than me and trust that I can leverage my abilities and those of others to produce better results. Facilitation (As a Career/Job) • I will become a better facilitator. • It will make me a better trainer. I how have more tools in my toolbox. Leadership Development • To have greater understanding of one self personally enhances professional identity & competence. The tools & material from the class can further be applied to professional challenges. • I can now look at problems and challenges in new and different ways. • Know how to solve my own and other peoples' problems. • Seeking situations that relate to my style. Avoiding those which conflict with my personal style.	Educational/Classroom Settings • I will take the wonderful ideas I learned in this class and pass them on to students and teachers I currently work with. • I feel it will greatly help with classroom management. • I can apply the tools into my daily classroom activities. Enhancing/Improving Professional Setting • As a professional, I will be able to deal with different issues, persons at the same time, help them in whatever necessary it could be. • My field of study is public relations and during the course of my practice, creative problem solving will come into play. Facilitation (As a Career/Job) • Yes – it will benefit. I will use the tools in facilitating. Sometimes, I may even use the CPS process. • Seek different ways in how to approach problems in work and may continue with some facilitation experiences. Leadership Development • It may lead tome showing more leadership at work as well as self-assessment in my decision making. • Once I learn how to be creative – now I know the process I can begin to ask…LEAD others to be. • In terms of leadership, recognize my personal responsibility for my own creativity and the environment and create – so that I can improve the climate for creativity and productivity. Personal Improvements • This course has given me a more positive outlook on problem-solving.

High Ideator (cont.)	**Low Ideator (cont.)**
Leadership Development (cont.) • I will be better equipped to solve problems as they arise. Personal Improvements • This course will help with my research efforts at work and in group problem solving sessions that I often encounter at work. • It will improve my group work and especially facilitating problems and challenges. • I will use the CPS process when I am an administrator! For sure! Yes, I will use it as a teacher, now, but it can be even more powerful when I am leaving a group of professionals.	Personal Improvements (cont.) • It will enable me to solve problems at my job. • It will help me to advance and gives me a proven program that can be applied in any circumstances which will help advance my problem solving ability. Miscellaneous • Not a lot of people have the knowledge and experience of CPS. • I'm retiring.

High Developer	**Low Developer**
Educational/Classroom Settings • A whole lot! As I am a teacher and hopefully future researcher I will use these techniques in teaching, researching, etc., in the future Leadership Development • Once I learn how to be creative – now I know the process I can begin to ask…LEAD others to be. • I have tools to use for different needs as a team leader. Use PPCs as a leader. Reflect on whether we're solving the right problem or need to clarify it further. Personal Improvements • This course has given me a more positive outlook on problem-solving. Problem Solving In A Group Setting • Group work will be easier. Problem solving for tasks – where to begin, etc. Miscellaneous • Don't know! • I'm retiring.	Deferring Judgement • Defer judgment and make sure you are solving the right problem. Educational/Classroom Settings • I plan to integrate tool usage into school curriculum. • I will strive to increase my awareness of others learning styles. I will utilize various models within my classroom, as well as share with my colleagues. In making personal decisions. I will be asked for input and be able to offer more knowledgeable and varied answers and suggestions. Enhancing/Improving Professional Setting • Day to day applications for organizational skills, and revising policies and procedures. • In my future and my job now I try to relate my learnings to it. • It will allow me to prioritize what is important to me. I can take the CPS process to my boss to look at different ways of running the company more efficiently. • I think it will give me an edge over my co-workers at Disney. I will move up faster because I can make things work that they can't get past. • Assist in providing tools to clarify and solve goals, wishes and challenges, professionally. • Many times a CPS experience is what my coworkers would benefit from. • I will be more creative in my professional life. • I hope I will have success above and others will take note of the fact that I have a unique way of getting to problem and helping in solution.

	Low Developer (cont..) Enhancing/Improving Professional…(cont.) • As a future school leader it will be imperative that I establish a creative environment for problem solving and change for improving my school. Being familiar with CPS will make my job easier and more successful. • I believe it will make my job much easier to perform. Facilitation (As a Career/Job) • It will make me a better trainer. I how have more tools in my toolbox. • I am now a better facilitator. Personal Improvements • Know how to solve my own and other peoples' problems. • Seeking situations that relate to my style. Avoiding those which conflict with my personal style. • Better way to generate ideas for solving problems. I don't always have to be the expert! • I will be able to share the process and help others solve their problems. • Deal with challenges more objectively. • It will help me become more understanding of the different problems and in life. Has helped me to deal with problems better. Problem Solving In A Group Setting • I will use the CPS process when I am an administrator! For sure! Yes, I will use it as a teacher, now, but it can be even more powerful when I am leaving a group of professionals.

High Implementer	**Low Implementer**
Deferring Judgement • Deferring judgement – that way I won't "jump" to conclusions automatically. In teaching and practicing conflict resolution techniques. I see a lot of applications there. • To be open to ideas. • I will be able to defer judgment and help others do the same. Educational/Classroom Settings • I plan to integrate tool usage into school curriculum. • I can apply the tools into my daily classroom activities. • Allows me the opportunity to apply it to my classroom as well as to help create lessons to increase cognitive learning. • I will strive to increase my awareness of others learning styles. I will utilize various models within my classroom, as well as share with my colleagues. In making personal decisions. I will be asked for input and be able to offer more knowledgeable and varied answers and suggestions. • Professionally, CPS is an excellent tool that an educational leader can use. It provides for teamwork and collaboration which many schools today unfortunately do not have enough of. • Use in my middle school classroom with children to have a more structured way to a creative learning environment. Will be deferring judgment more. Enhancing/Improving Professional Setting • Day to day applications for organizational skills, and revising policies and procedures. • I'm a business major, one day I plan on being a manager. I really believe that creativity belongs in the workplace.	Application of Tools • I think these are great tools to know because I personally think they are very effective in a business setting. I feel it may be able to help my family's business as well as advertising needs. • I have new found tools which will enable me to be more productive. • It gave me many tools to use to take a proactive stance on tricky, stressful issues and it gave me tools to think big and look (more) objectively at challenges. Deferring Judgement • Again I return to deferring judgment – it's amazing how conversations and professional dealings grow when one just pauses for a moment and listens. Educational/Classroom Settings • Working towards certificate in educational leadership. Applications of CPS in classroom situations. • It provided alternative methods (tools) which I can use in the classroom (my classroom). • A whole lot! As I am a teacher and hopefully future researcher I will use these techniques in teaching, researching, etc., in the future. • As a teacher I feel I am on the verge of a major breakthrough. I want to find ways to use more kinesthetic learning device in class and also find ways to make class more fun and compelling for the kids. Enhancing/Improving Professional Setting • To organize and think of a whole company instead of just me. To think of new ideas for teaching. • I will try to nurture creativity in the work environment and pay closer attention to my comments/ideas. Try to keep it fun.

High Implementer (cont.)	**Low Implementer (cont.)**
Enhancing/Improving Professional (cont.) • It will allow me to prioritize what is important to me. I can take the CPS process to my boss to look at different ways of running the company more efficiently. • This course has and will benefit me professionally because and have (will) use(d) it in my writing group and with the faculty. • Assist in providing tools to clarify and solve goals, wishes and challenges, professionally. • Many times a CPS experience is what my coworkers would benefit from. • I will be more creative in my professional life. • I can use it with clients in therapeutic setting. Facilitation (As a Career/Job) • Proper facilitation technique. I facilitate a lot and this honed my skills. • I am now a better facilitator. Leadership Development • Useful in management and leadership. I think CPS will greatly improve chances of career advancement. • I'm better prepared to be a leader and also to handle problems in the future. • In terms of leadership, recognize my personal responsibility for my own creativity and the environment and create – so that I can improve the climate for creativity and productivity. • It has taught me how to be a good leader and the value of being prepared. The skills I learned have made me a more valuable employee.	Enhancing/Improving Professional…(cont.) • It has given me great ideas on organization of my time and thought process that is essential in my professional career. Facilitation (As a Career/Job) • Too many ways to count. I facilitate so I learned, tools, techniques and theory I can pass along to others. Leadership Development • I have tools to use for different needs as a team leader. Use PPCs as a leader. Reflect on whether we're solving the right problem or need to clarify it further. Personal Improvements • To have greater understanding of one self personally enhances professional identity & competence. The tools & material from the class can further be applied to professional challenges. • I can now look at problems and challenges in new and different ways. Problem Solving In A Group Setting • It will help to continue my team building strategies. • Group work will be easier. Problem solving for tasks – where to begin, etc. • I work with a team so it can benefit using on problem we work to solve or help each other. Future jobs as well wherever I go to work. Miscellaneous • Hopefully the next job I get will require me to use it.

High Implementer (cont.)	
Personal Improvements • Clarifying the problem and strengthening solutions – praise 1st – many times people shoot down ideas before even trying them or really even understanding them. • I hope to keep learning and practicing the CPS process until I am comfortable using it in all aspects of my life. • It will enable me to solve problems at my job. • Better way to generate ideas for solving problems. I don't always have to be the expert! • I will be able to share the process and help others solve their problems. • Deal with challenges more objectively. • It will help me to advance and gives me a proven program that can be applied in any circumstances which will help advance my problem solving ability. Problem Solving In A Group Setting • Will run problem-solving sessions in a different way. Have more confidence. Have knowledge base and terminology for credibility.	

Appendix G

This appendix contains the form “Proposal Abstract: Research Involving Human Subjects.”

BUFFALO STATE COLLEGE

INSTITUTIONAL REVIEW BOARD

1300 Elmwood Ave. Buffalo, New York 14222-1095

Proposal No.: HS

PROPOSAL ABSTRACT: RESEARCH INVOLVING HUMAN SUBJECTS

Name of Project Director: Dr. Gerard J. Puccio & Russell A. Wheeler

Name of Advisor **(if appropriate):** Dr. Gerard J. Puccio

Title of Project: Improving the Understanding of the Impact of Creative Problem Solving Training through an Examination of Individual Differences.

Duration of Project: April 2000 to December 2000

Date Submitted for Review: March 29, 2000

Brief Description of Project **(PLEASE COMPLETE):** The purpose of the study is to explore relationships between individuals' problem solving styles and their perceptions of Creative Problem Solving (CPS). Survey data will be collected in both undergraduate and graduate introductory CPS courses.

Degree of Risk: None X (Minimal) 1. 2. 3. 4. (Maximal)

Written Consent Required: Yes X No

Parental/Guardian Consent Required: Yes No X

Clinical Procedures to be Employed: Yes *No* X

Questionnaire to be Administered: Yes X No

SUCB Students Involved as Subject. Yes X *No*

Status of Project Director: Faculty/Staff X Student X

COMMITTEE ACTION:

Approved Disapproved

Comments:

Chairperson, Institutional Review Board **Date**

ATTACHMENT A

REQUEST FOR APPROVAL OF PROGRAM INVOLVING HUMAN SUBJECTS

NAME OF PROJECT DIRECTOR: Dr. Gerard J. Puccio & Russell A. Wheeler

TITLE OF PROJECT: Improving the Understanding of the Impact of Creative Problem Solving Training through an Examination of Individual Differences.

DURATION OF PROJECT: April through December 2000

SOURCE OF FUNDING: Not Applicable

Attach a brief abstract of proposed program (or application if support is being requested) and include the following:

a. Description of the project (objectives and design).

b. Describe procedure or procedures in term of what will be done to the subject and what will be the consequences including hazards and potential benefits to the subject of the procedure as it will be described to the subject.

c. How will informed, written consent be obtained? Provide a copy of the consent form to be used.

d. May human subjects be exposed to any possible harm either physically, psychologically, sociologically or emotionally as a result of their involvement with this program?

e. Will a questionnaire format be used? If so, please attach a sample. If it is to be a structured interview, provide list of questions or topics, and specifics as to how the confidentiality of information will be maintained by the project director.

f. Will minors be involved as human subjects? If so, how will informed, written consent of parent or guardian be obtained?

g. Describe clinical procedures to be used, if any (medical, psychological, psychiatric, etc.)

h. Is there a possibility of substantial risk to human subjects? If so,please estimate the degree of risk:

NONE (MINIMAL) 1. 2. 3. 4. (MAXIMAL)

i. Provide a justification of the degree of risk involved in relation to the potential benefit of the project to the subject.

j. Describe the time period within the duration of the project when human subjects will be used.

Signature of Project Director

Request for Approval of Program Involving Human Subjects Addendum

(a) The project involves the distribution of two self-report measures to both graduate and undergraduate introductory Creative Problem Solving (CPS) courses. The focus of the project is to enhance our understanding of the impact of CPS training through the analysis of individual differences. Specifically, to investigate if there is a relationship between preferences reported on the Buffalo Creative Process Inventory (a measure of individual's preferences for different stages of the CPS process) and students' perceptions of CPS (i.e. what was perceived to be most valuable and what aspects of CPS were the most enjoyable to learn).

(b) The BCPI will be given first, and at the end of the course, a survey will be distributed to collect students' perceptions of CPS training. These self-report measures will be given to students in CRS 559 - Principles in Creative Problem Solving and CRS 302w - Creative Approaches to Problem Solving. In total it will take approximately 20 minutes to complete both self-report measures. Before the end of the course students will receive feedback on the results of the BCPI. It is hoped that this information will help them understand better how they approach the problem solving process. Data, without individual identifiers, will be entered into a spreadsheet and analyzed through Statistical Package for the Social Sciences software.

(c) Written consent will be asked from students in the classes prior to distribution of the surveys.

(d) There is no known physical, psychological, sociological or emotional harm to the subjects.

(e) Self-report measures have been provided.

(f) No minors will be surveyed in this research.

(g) No clinical procedures will be used.

(h) There is no substantial risk to human subjects.

(i) Not applicable.

(j) Data will be collected in Spring 2000, Summer 2000 and Fall 2000. Again, research participants will be directly involved in data collection for about 20 minutes (i.e. it will take approximately 20 minutes to complete both surveys).

ATTACHMENT C

PROJECT DIRECTOR'S CERTIFICATION
PROGRAM INVOLVING HUMAN SUBJECTS

The proposed investigation *(research or training program)* involves the use of human subjects and I am submitting the completed application form and description of the project to the Institutional Review Board for Research Involving Human Subjects.

If the Board grants approval of this application, I agree to:

1. Abide by any conditions or changes in the project required by the Board.
2. Report to the Board any change in the research plan which affects the method of using, human subjects before such change is instituted.
3. Report to the Board any problems which arise in connection with the use of human subjects.
4. Seek advice of the Board whenever I believe such advice necessary or would be helpful.
5. Secure the informed, written consent of all human subjects participating in the project.
6. Cooperate with the Board designated in its effort to provide a continuing review after investigations have been ini6ated.

I have reviewed the Federal and State, regulations concerning the use of human subjects in research and training programs and the guidelines of the State University College at Buffalo. I agree to abide by the regulations and guidelines aforementioned and will adhere to policies and procedures described in my application.

_____ _____

Signature of Project Director ***Signature of Department Chairperson***

****

ACTION OF REVIEW BOARD

The Institutional Review Board for Research Involving Human Subjects has reviewed this application to ascertain whether or not the proposed project:

(1) provides adequate safeguards of the rights and welfare of human subjects involved in the investigation; (2) uses appropriate methods to obtain informed, written consent; (3) indicates that the potential benefits of the investigation substantially outweigh the risks involved.

BOARD DISPOSITION:

_____ _____

Chairperson, Institutional Review Board ***Date***

Appendix H

This appendix contains the “Letter of Consent to Participate in Research Study” form.

LETTER OF CONSENT TO PARTICIPATE IN RESEARCH STUDY

This letter briefly describes the purpose of this research study and seeks your consent to participate in this study.

The main purpose of this study is to enhance our understanding of the impact of CPS training through the analysis of individual differences. Specifically, we are investigating the relationship between thinking styles and students' perceptions of their course experience.

Your participation in this study is voluntary. You may choose to withdraw from this research at any time. Your participation is confidential. Individual results will be shared with no one else. If research results are published, only descriptive data for the group will be included.

Please give your consent by signing below. You must be 18 years of age or older to participate in this study. Thank you for your assistance.

_____ _____

Name Date

Appendix I

This appendix contains the end-of-course survey based on the CPS process described by Vehar, Firestien and Miller (1999).

Creative Problem Solving Course Survey

Developed by Russell A. Wheeler

Description: The Creative Problem Solving (CPS) Course Survey is designed to investigate the degree to which you enjoyed learning the CPS process, as well as your beliefs with regard to how useful this material will be for you in the future.

Directions: Parts One and Two contain the CPS components, principles, stages and tools you learned in this course. For Part One, rank order how much you enjoyed learning the CPS components, principles, stages and tools; and for Part Two, rank order the future value of the component, principle, stage and tool in your daily activities. Please indicate your thoughts by ranking the options from highest to lowest, using one (1) to indicate the highest-ranking option (see example). **Both Parts One and Two have sections that need to be ranked separately.** Part Three contains three open-ended questions. These are designed to (1) ascertain your most significant learning from this course and why; (2) how you will *personally* benefit from this course; and (3) how you will *professionally* benefit from this course. **NOTE:** *Do not answer a question if you did not learn the concept or tool!*

Example	
Apples	3
Oranges	1
Bananas	2

Part I – Enjoyment of Learning

(Remember that you are ranking the sections of Part I on your "enjoyment" from learning CPS.)

Section I - Creative Problem Solving Components & Principles

A. Components (Rank from 1 to 3)

- Explore the Challenge _____
- Generate Ideas _____
- Prepare for Action _____

B. Principles (Rank from 1 to 12)

- Dynamic Balance _____
- Divergent Thinking _____
- Defer Judgement _____
- Strive for Quantity _____
- Seek Wild & Unusual Ideas _____
- Build On Other Ideas _____
- Convergent Thinking _____
- Be Affirmative _____
- Be Deliberate _____
- Check Your Objectives _____
- Improve Ideas _____
- Consider Novelty _____

Section II - Creative Problem Solving Stages

(Rank from 1 to 6)

- Identify the Goal, Wish, Challenge _____
- Gather Data _____
- Clarify the Problem _____
- Generate Ideas _____
- Select & Strengthen Solutions _____
- Plan for Action _____

Please continue at the top, right hand side.

Section III - Creative Problem Solving Tools

(Rank from 1 to 13)

- Brainstorming _____
- Stick 'em Up Brainstorming _____
- Brainwriting _____
- Forced Connections _____
- Word Dance _____
- SCAMPER _____
- Visual Connections _____
- Ladder of Abstraction _____
- Excursions _____
- Highlighting _____
- Praise First (PPCO) _____
- Card Sort _____
- Evaluation Matrix _____

Part II – Future Value

(Remember that you are ranking the sections of Part II on your "perceived future value" in using CPS.)

Section I – Creative Problem Solving Components & Principles

A. Components (Rank from 1 to 3)

- Explore the Challenge _____
- Generate Ideas _____
- Prepare for Action _____

Please Turn Over to Continue With Part Two, Section One.

Continue Survey Here.

B. **Principles** (Rank from 1 to 12)

- Dynamic Balance _____
- Divergent Thinking _____
- Defer Judgment _____
- Strive for Quantity _____
- Seek Wild & Unusual Ideas _____
- Build On Other Ideas _____
- Convergent Thinking _____
- Be Affirmative _____
- Be Deliberate _____
- Check Your Objectives _____
- Improve Ideas _____
- Consider Novelty _____

Section II - Creative Problem Solving Stages
(Rank from 1 to 6)

- Identify the Goal, Wish, Challenge _____
- Gather Data _____
- Clarify the Problem _____
- Generate Ideas _____
- Select & Strengthen Solutions _____
- Plan for Action _____

Section III - Creative Problem Solving Tools
(Rank from 1 to 13)

- Brainstorming _____
- Stick 'em Up Brainstorming _____
- Brainwriting _____
- Forced Connections _____
- Word Dance _____
- SCAMPER _____
- Visual Connections _____
- Ladder of Abstraction _____
- Excursions _____
- Highlighting _____
- Praise First (PFCO) _____
- Card Sort _____
- Evaluation Matrix _____

Please continue at the top, right-hand side.

Part III – General Questions

1. What do you believe was the most important thing you learned in this course and why?

_____
_____
_____
_____
_____
_____
_____
_____

2. How do you feel this course will benefit you *personally*?

_____
_____
_____
_____
_____
_____
_____
_____

3. How do you feel this course will benefit you *professionally*?

_____
_____
_____
_____
_____
_____

Thank you for taking the time to complete this survey. Your responses to these questions will assist me in completing the research for my thesis. Your assistance is greatly appreciated!

Appendix J

This appendix contains the end-of-course survey based on the CPS process described by Isaksen, Dorval and Treffinger (1994).

Creative Problem Solving Course Survey

Developed by Russell A. Wheeler

Description: The Creative Problem Solving (CPS) Course Survey is designed to investigate the degree to which you enjoyed learning the CPS process, as well as your beliefs with regard to how useful this material will be for you in the future.

Directions: Parts One and Two contain the CPS components, principles, stages and tools you learned in this course. For Part One, rank order how much you enjoyed learning the CPS components, principles, stages and tools; and for Part Two, rank order the future value of the component, principle, stage and tool in your daily activities. Please indicate your thoughts by ranking the options from highest to lowest, using one (1) to indicate the highest-ranking option (see example). **Both Parts One and Two have sections that need to be ranked separately.** Part Three contains three open-ended questions. These are designed to (1) ascertain your most significant learning from this course and why; (2) how you will *personally* benefit from this course, and (3) how you will *professionally* benefit from this course. **NOTE:** *Do not answer a question if you did not learn the concept or tool!*

Example	
Apples	3
Oranges	1
Bananas	2

Part I – Enjoyment of Learning

(Remember that you are ranking the sections of Part I on your "enjoyment" from learning CPS.)

Section I - Creative Problem Solving Components & Principles

A. Components (Rank from 1 to 3)

- Understanding the Problem _____
- Generating Ideas _____
- Planning for Action _____

B. Principles (Rank from 1 to 10)

- Dynamic Balance _____
- Divergent Thinking _____
- Defer Judgment _____
- Strive for Quantity _____
- Freewheel _____
- Seek Combinations _____
- Use Affirmative Judgment _____
- Be Deliberate _____
- Consider Novelty _____
- Stay on Course _____

Section II - Creative Problem Solving Stages

(Rank from 1 to 6)

- Mess-Finding _____
- Data-Finding _____
- Problem-Finding _____
- Idea-Finding _____
- Solution-Finding _____
- Acceptance-Finding _____

Please continue at the top, right hand side.

Section III - Creative Problem Solving Tools

(Rank from 1 to 13)

- Brainstorming _____
- Brainstorming with Post-Its™ _____
- Brainwriting _____
- Forced Fit _____
- Visually Identifying Relationships _____
- SCAMPER _____
- Attribute Listing _____
- Morphological Matrix _____
- Hits _____
- Highlighting _____
- ALUo _____
- Paired Comparison Analysis _____
- Evaluation Matrix _____

Part II – Future Value

(Remember that you are ranking the sections of Part II on your "perceived future value" in using CPS.)

Section I – Creative Problem Solving Components & Principles

A. Components (Rank from 1 to 3)

- Understanding the Problem _____
- Generating Ideas _____
- Planning for Action _____

Please Turn Over to Continue With Part Two, Section One.

Continue Survey Here.

B. **Principles** (Rank from 1 to 10)

- Dynamic Balance _____
- Divergent Thinking _____
- Defer Judgment _____
- Strive for Quantity _____
- Freewheel _____
- Seek Combinations _____
- Use Affirmative Judgment _____
- Be Deliberate _____
- Consider Novelty _____
- Stay on Course _____

Section II - Creative Problem Solving Stages
(Rank from 1 to 6)

- Mess-Finding _____
- Data-Finding _____
- Problem-Finding _____
- Idea-Finding _____
- Solution-Finding _____
- Acceptance-Finding _____

Section III - Creative Problem Solving Tools
(Rank from 1 to 13)

- Brainstorming _____
- Brainstorming with Post-Its™ _____
- Brainwriting _____
- Forced Fit _____
- Visually Identifying Relationships _____
- SCAMPER _____
- Attribute Listing _____
- Morphological Matrix _____
- Hits _____
- Highlighting _____
- ALUo _____
- Paired Comparison Analysis _____
- Evaluation Matrix _____

Please continue at the top, right-hand side.

Part III – General Questions

1. What do you believe was the most important thing you learned in this course and why?

_____
_____
_____
_____
_____
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_____
_____

2. How do you feel this course will benefit you *personally*?

_____
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_____
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_____

3. How do you feel this course will benefit you *professionally*?

_____
_____
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_____
_____
_____

Thank you for taking the time to complete this survey. Your responses to these questions will assist me in completing the research for my thesis. Your assistance is greatly appreciated!

Appendix K

This appendix contains the approved Concept Paper used in this research study.

Theme:
Understanding Multifaceted Interactions Among Person, Process, Product, and Press/Environment

Initiative:
Developing new instrumentation for one or more of the four P's framework

Thesis Title: Improving the Understanding of the Impact of Creative Problem Solving Training through an Examination of Individual Differences.

Rationale and Questions: The focus of this thesis is to enrich my understanding of the impact of Creative Problem Solving (CPS) training through the analysis of individual differences. I aspire to learn if there is a relationship between Buffalo Creative Process Inventory (BCPI) preferences and the perceived value of learning CPS. Specifically, I will investigate the degree of enjoyment from learning components, stages and tools of the CPS process; and which components, stages and tools will the student find of value in the future. People tend to prefer the use of certain components, stages and tools over others. For example, as an individual learns the CPS process, the person may engage him/herself more or less at various stages in the process. I base the aforementioned statement on my own preference to spend time understanding and defining the problem before proceeding forward, which is the CPS component Understand the Problem (Isaksen, Dorval & Treffinger, 1994)/Explore the Challenge (Vehar, Firestien & Miller, 1997).

Specific questions that will guide the study are:

- To what degree did students enjoy learning the various components, stages and tools of the CPS process?
- Which components, stages and tools do students believe will be of most value to them in the future?
- What are the relationships between students reported enjoyment and perceived value of the CPS training, and their CPS styles as measured by the BCPI?

Statement of Significance: Prior research has been conducted on the effectiveness of the six-day CPS workshop and the impact of the course content on the lives of the participants (Keller-Mathers, 1990; Nielson, 1990); and the relationship between cognitive style and the preference for specific CPS tools (Hurley, 1993; Zilewicz, 1986). Specifically, Hurley (1993) investigated "the nature of the relationship between cognitive style and use of CPS techniques" (p. 2). The quantitative results produced style differences, which were based on the Kirton Adaption-Innovation (KAI) Inventory, in the use of creativity techniques after CPS training. This study will be an extension of this research as well as validating the specific styles of the BCPI (Puccio, 1999). Historically, cognitive styles have been measured through the KAI and the Myers-Briggs Type Indicator to assess the relationship to CPS behavior. The BCPI is a psychological instrument based on the CPS process, specifically designed to measure CPS behavior. The intent of the BCPI "is to help people become aware of their Creative Problem

Solving preferences so that they can better understand their strengths and weaknesses when solving problems creatively" (Puccio, 1999, p. 172).

Description of the Method or Process: To obtain data for this thesis, two paper and pencil measures will be given. The BCPI, a 30-question measure designed to identify students' CPS preferences, will be given first. The BCPI will be administered to students in four sections of the graduate course CRS 559 – Principles in Creative Problem Solving, and two sections of the undergraduate course CRS 302 – Creative Approaches to Problem Solving. Two sections of the CRS 559 course will receive feedback on the BCPI after taking the measure; the other four sections (graduate and undergraduate) will not receive feedback on the BCPI. The second measure will be designed and carried out at the end of all six courses, after the administration of the BCPI; and it will determine if the results of the BCPI accurately describe the subject. The subjects will be asked a series of closed-ended questions that can be answered on a Likert Scale from one (least likely) to four (very likely). Questions will encompass the three components; the six stages; the dynamic balance between divergent and convergent thinking; and the tools of the CPS process taught by the instructor of the course. One open-ended question will be asked which focuses on identifying the most significant key learning from taking a course on CPS. Subjects will also be asked their gender, age and occupation. Both the quantitative questions and one qualitative question from the survey will be analyzed with reported BCPI styles. The four styles of the BCPI (i.e. Clarifier, Ideator, Developer, Implementer) will be used to examine individual differences in students responses to the quantitative questions and one qualitative question from the survey.

Learning Goals:

- To provide the field of creativity with a quality piece of research;
- To write a scholarly work that can be adapted for future article publication;
- To understand the validity of the BCPI;
- To build off the thesis research and continue to understand the effectiveness of the BCPI in relation to CPS training;
- To solidify my understanding of CPS training;
- To provide a foundation for personal direction of future CPS research; and
- To enjoy the process of thesis research from beginning to its conclusion.

Outcomes:

- To collect quantitative and qualitative data to investigate the validity of the BCPI in relation to CPS training.
- Creativity Based Information Resources (CBIR) annotations (10-20 as topical, see advisor; one must be my thesis).

Timeline:

- November 1999 - Concept Paper approved for thesis work.
- December 1999 - Approval of survey to be administered in CRS 559 and CRS 302.
- February 2000 - Submission of first draft of Chapter One.
- April 2000 - Submission of first draft of Chapter Two.
- April 2000 - BCPI and survey administered in CRS 559 and CRS 302.

- June 2000 - Submission of first draft of Chapter Three.
- June 2000 - BCPI and survey administered in CRS 559.
- November 2000 - BCPI and survey administered in CRS 559 and CRS 302.
- November 2000 - Submission of final draft of thesis.
- December 2000 - Master's thesis approved and signed.
- December 2000 - Graduate with Master of Science in Creativity and Innovation.

Principal Investigators:

- Faculty Advisor/Committee: Dr. Gerard J. Puccio
- Student/Advisee: Russell A. Wheeler

Related Literature:

Hurley, C. A. (1993). The relationship between the kirton adaption-innovation style and the use of creative problem solving. Unpublished master's thesis, State University College at Buffalo, Buffalo, NY.

Isaksen, S. G., Dorval, K. B., & Treffinger, D. J. (1994). Creative approaches to problem solving. Dubuque, IA: Kendall-Hunt.

Keller-Mathers, S. (1990). Impact of creative problem solving training on participants' personal and professional lives: A replication and extension. Unpublished master's project, State University College at Buffalo, Buffalo, NY.

Nielson, L. (1990). Impact of creative problem solving training: An in-depth evaluation of a six day course in creative problem solving. Unpublished master's project, State University College at Buffalo, Buffalo, NY.

Osborn, A. F. (1953/1979). Applied imagination: Principles and procedures of creative problem-solving. New York: Scribners.

Puccio, G. J. (1999). Creative problem solving preferences: Their identification and implications. Creativity and Innovation Management, 8 (3), 171-178.

Vehar, J. R., Firestien, R. L., & Miller, B. J. (1997). Creativity unbound. Williamsville, NY: Innovation Systems Group.

Zilewicz, E. P. (1986). Cognitive styles: Strengths and weaknesses when using creative problem solving. Unpublished master's project, State University College at Buffalo, Buffalo, NY.