

Destination ImagiNation

Program Evaluation Report

Dr. Carolyn M. Callahan
Dr. Holly Hertberg-Davis
Tracy C. Missett

University of Virginia
Curry School of Education

January, 2011

DESTINATION IMAGINATION PROGRAM EVALUATION REPORT

INTRODUCTION

In August 2009, Destination ImagiNation (DI) contracted with an Evaluation Team composed of three evaluators from the University of Virginia, Curry School of Education to conduct an independent evaluation of the DI program's effectiveness, impact, and participant satisfaction in areas relating to creative problem-solving, creative and critical thinking, teamwork, and leadership. In order to evaluate DI program outcomes in these areas, the Evaluation Team developed a Program Evaluation Plan (PEP) outlining five (5) General Questions designed to document DI program effectiveness, impact, and participant satisfaction in these areas. These five General Questions were:

General Question 1:

To what degree are the primary stakeholders in the Destination ImagiNation program satisfied with the outcomes of the program and program operation? The Evaluation Team defined Primary stakeholders to include students who participate in DI, parents of students who compete in DI, DI Team Managers, Affiliate and Regional DI Directors, and DI Board of Directors.

General Question 2

Does participation in the activities and tournaments provided by DI contribute to the development of creative thinking skills in the students who participate in those activities and tournaments?

General Question 3

Does participation in the activities and tournaments provided by DI contribute to the development of critical thinking skills in the students who participate in those activities and tournaments?

General Question 4

Does participation in the activities and competitions provided by DI contribute to the development of creative problem solving skills in the students who participate in those activities and tournaments?

General Question 5

Does participation in the activities and competitions provided by DI contribute to the development of the skills of effective teamwork in the students who participate in those activities and tournaments?

To answer each of the General Questions, and as discussed fully in the Evaluation Outcome section below, the Evaluation Team surveyed DI stakeholders on DI program outcomes and satisfaction interviewed a sample of DI Board members, and coordinated the administration of three assessments. The three assessments included the Cornell Critical Thinking Test – Level X (CCTT), the Torrance Test of Creative Thinking -- Verbal (TTCT), and a performance task called Monkey in Motion (MiM). The assessments were administered in Virginia, Illinois, Texas, and California where DI has well-developed and active programs. The PEP further included data collection procedures (including a sampling plan for each question), the type of instrument(s) to be used, data analysis procedures and interpretation, and means of presenting findings. This report summarizes the evaluation findings as per the contract requirements.

Each General Question, along with the data collection and data analysis procedures set forth in the PEP, is discussed fully below.

EVALUATION PLAN ASSUMPTIONS

In determining the feasibility of all components of the PEP, the Evaluation Team made several assumptions.

First, the Evaluation Team assumed adequate, ongoing, and open communication between the DI program personnel requesting the evaluation and the Evaluation Team throughout the evaluation. This assumption rested upon the recognition that the effectiveness of an evaluation is enhanced if the evaluation team and the individuals requesting the evaluation work as a team from the inception of the evaluation process until the delivery of findings. We are pleased to report that we found communication to be open and forthright throughout the process.

Second, the Evaluation Team assumed throughout the program evaluation significant support and involvement from all DI stakeholders including specifically the DI Board of Directors, DI Directors, DI Team Managers, and DI students in carrying out all facets of the PEP. As discussed with those requesting the evaluation at PEP outset, the basis for this assumption derived from the Evaluation Team's total and necessary reliance on these stakeholders for assistance in locating and securing the involvement of evaluation participants for all components of the PEP. Without the full support and involvement of DI stakeholders, it would not be possible for the Evaluation Team to find enough participants to make adequate and robust conclusions from the evaluation. The stakeholders at the central level (DI Board and administrators) were most supportive and involved. With a few notable exceptions, we did encounter difficulties in getting full support of those at the state and local level. Seemingly, their commitment to program operations rested squarely in working with the teams and in competition. Interest in supporting the evaluation efforts was often very low and presented difficulty in gathering sample sizes as large as we had hoped.

Third, the Evaluation Team designed the evaluation to be independent. In other words, the PEP reflected a spirit of "disinterest" or neutrality on the part of the Evaluation Team in the outcome of the evaluation for all questions. Thus, the instruments chosen, participant selection, and data analysis and procedures purposefully and consistently ensured neutrality on the part of the Evaluation Team. The Evaluation Team was given full authority in this realm.

EVALUATION TIMELINE

August 2009 – In August 2009, the Evaluation Team met with the DI personnel requesting the evaluation to discuss and make final refinements to the PEP. Shortly thereafter, DI provided email addresses for DI Directors and DI Team Managers from the 2008-2009 school year to the

Evaluation Team. The purpose of obtaining these addresses was to enable the Evaluation Team to contact a stratified random sample of stakeholders for purposes of surveying them.

September 2009 to December 2009 – During the fall of 2009, the Evaluation Team sought and obtained approval to conduct the research outlined in the PEP from the University of Virginia's Institutional Review Board. During the Institutional Review Board process, the Evaluation Team developed four DI stakeholder surveys (DI Directors, Team Managers, Parents, and Students) and revised them per the recommendations of DI. The Evaluation Team conducted a field test of the surveys with a small sample of DI students, parents, Team Managers, and Directors followed by final revisions to the surveys.

The Evaluation Team drafted and sent correspondence to both DI Directors and Team Managers across the United States. The correspondence outlined the PEP and requested the full support of Directors and Team Managers in its implementation. This correspondence specifically indicated that DI Directors and Team Managers would be pivotal in identifying participants for the evaluation and assisting in recruiting participants for the evaluation. This correspondence generated numerous inquiries from Team Managers across the country, which the Evaluation Team responded to. The Evaluation Team also participated in conference calls with Directors to discuss the PEP and the assistance that would be needed in all phases of its implementation.

December 2009 – The Evaluation Team surveyed DI Directors on program effectiveness and participant satisfaction. The Evaluation Team continued to answer numerous questions from Team Managers regarding the PEP.

January 2010 to May 2010 – Pursuant to the PEP, the Evaluation Team randomly selected over 1,000 Team Managers from the 2008-2009 school year to be surveyed from the e-mail lists

provided by DI. At the same time, the Evaluation Team requested that these Team Managers provide e-mail or home addresses for parents of students on their DI Teams. Because DI did not have a separate list of student or parent e-mail addresses, the evaluation team relied on Team Managers to forward parent email or home addresses and also relied on parents who responded to the survey to further provide student e-mail addresses. Pursuant to the PEP, the evaluation team initially focused on students who were in middle school and the parents of middle school DI participants.

Contrary to the assumption of robust and cooperative involvement from DI Team Managers, response to both the survey and requests for parent contact information was extremely low with many Team Managers voicing the concern that they felt “uncomfortable” providing parent information. Reassurances that the surveys were anonymous, were fully supported by the DI program, and would be used solely for purposes of the evaluation did not yield meaningful additional support. Consequently, the Evaluation Team increased both the number of Team Managers surveyed and solicited for parent contact information several additional times during this period. The Evaluation Team also expanded the participant selection to include middle and high school students who participated in DI during the 2008-2009 school year, and parents of DI participants of all ages. Nevertheless, the Evaluation Team continued to receive unexpectedly low survey responses and assistance from Team Managers in locating parents and student participants to survey. Due to persistently low response rates, the Evaluation Team ultimately surveyed all Team Managers identified by DI and asked all Team Managers to provide parent contact information. However, response rates continued to be low with less than 300 Team Managers responding to surveys and less than 100 Team Managers out of several thousand providing parent e-mail addresses by the end of this frame.

Notwithstanding the scant parent e-mail addresses available to the Evaluation Team, all parents known to the Evaluation Team received survey requests. The Evaluation Team simultaneously requested parents to forward a survey link to their middle school DI children. By May, less than 100 parents and fewer than 50 students had responded to the survey after three requests, again in contrast of the assumption of willing and enthusiastic participation among these stakeholders.

In an effort to increase survey participation among Team Managers, parents, and DI students, a member of the Evaluation Team traveled to Nashville in an effort to answer questions and concerns about the evaluation, and ultimately, obtain sufficient contact information for surveys to make results interpretable. As a result of this effort, several dozen parents and students agreed to complete surveys.

To further increase survey participation, and at the request of the Evaluation Team, DI directly contacted Team Managers and parents from the 2009-2010 DI year to request participation in the survey. Direct solicitation from DI yielded far greater response rates than those from the Evaluation Team. Ultimately, over 300 students and 800 parents responded to the survey. By the summer of 2010, the Evaluation Team determined that its efforts to obtain additional survey responses had been exhausted and few additional survey responses were likely.

Summer 2010 – By late Spring, having exhausted survey efforts, the Evaluation Team commenced preparations for the assessment phase of the PEP. The preparations consisted primarily of identifying DI Parents, Team Managers, and Directors from Virginia, Texas, Illinois, and California willing to assist the Evaluation Team in locating students (both DI and non-DI students) for the three assessments. Given the low survey response rate, the Evaluation Team drafted letters to these stakeholders but requested that they be sent directly by DI (rather

than by the Evaluation Team) based on the belief that responses would be greater if the solicitation came directly from DI.

At least one Director and several Team Managers in Texas, Illinois, and California stated a willingness to assist the Evaluation Team in both locating students to take the assessments and in administering the assessments. However, these Directors and Team Managers advised the Evaluation Team that they and their student participants would not be available until school reconvened in early September due to busy summer schedules. The Evaluation Team ordered and sent hundreds of test materials to interested administrators in Texas, Illinois, and California. The Evaluation Team also communicated its willingness to assist in the administration of the assessments on numerous occasions.

Administration of the assessments commenced in Virginia in June and continued through the summer. Although dozens of team managers and parents initially indicated a willingness to participate in the evaluation, actual participation in the assessments proved difficult to ensure. Ultimately, numerous Team Managers and parents who indicated an initial willingness to make students available withdrew. Consequently, a member of the Evaluation Team personally recruited multiple students – both DI and non-DI controls through summer enrichment camps, students in her own community, children of co-workers, and with the help of a small number of Team Managers and parents willing to make their students available. Again, the assumption that stakeholders would make recruitment of participants for the evaluation did not hold. A member of the Evaluation Team also traveled throughout the Commonwealth of Virginia during the summer of 2010 to administer the assessments under the PEP. Often, team managers represented that several participants would be available for testing but when the Evaluation Team member arrived to administer the assessments only one or two students were, in fact, available.

Fall 2010 – Commencing in the Fall of 2010, the assessment phase of the PEP concluded in Virginia. In the early Fall, the Evaluation Team scored all TTCT, CCTT and MiM assessments for Virginia participants and forwarded results to approximately 200 parents of participants. In Illinois, Texas, and California, the Evaluation Team worked closely with State and Regional Directors in these states to recruit participants. Moreover, although the Evaluation Team did not require consent forms for participation in the evaluation, the Evaluation Team was asked to create separate consent forms for each state in order to secure participation in those states. In Texas and California, adequate participant selection was greatly facilitated by the fact that Directors in those states were able to administer assessments to numerous students in school systems with which they were affiliated. In Illinois, locating participants proved more difficult. With the exception of the TTCT, a school system with a large number of students was not available for all phases of testing, and only a few parents and Team Managers proved willing to make participants available in smaller settings despite the efforts of the Director in the Chicago region. Consequently, participation in Illinois was low except in the case of the TTCT.

The Evaluation Team scored CCTTs as they became available from Texas and California. Throughout October and November, the Evaluation Team reported CCTT scores to over 200 parents via e-mail. In the case of Texas, the Evaluation Team provided a spreadsheet of scores to the State Director for distribution.

By mid-November, the testing phase of the evaluation concluded. The Evaluation Team sent TTCTs from California, Illinois, and Texas participants to Scholastic Testing Service for scoring. Scholastic returned scored TTCTs in late December. The Evaluation Team entered all remaining data for analysis.

EVALUATION OUTCOMES AND SPECIFIC FINDINGS

The outcomes of the evaluation and the specific findings related to each General Question are discussed separately.

General Question 1:

To what degree are the primary stakeholders in the Destination ImagiNation program satisfied with the outcomes of the program and program operation? The Evaluation Team defined Primary stakeholders to include students who participate in DI, parents of students who compete in DI, DI Team Managers, Affiliate and Regional DI Directors, and DI Board of Directors.

Sample: The Evaluation Team conducted in-depth surveys for each group of primary stakeholders (with the exception of the DI Board of Directors who were interviewed) to answer this question. The PEP proposed surveying a stratified random sample of stakeholders from names and email addresses provided by Team Managers and Affiliate Directors. However, as described in the evaluation timeline above, the Evaluation Team experienced significant difficulties obtaining stakeholder participation in the survey component of the evaluation. Consequently, all stakeholders known to the Evaluation Team and to DI received an invitation to participate in the surveys.

Survey Results: 160 DI Directors, 588 Team Managers, 824 parents and 347 middle and high school students participated in the survey. Detailed survey results for these primary stakeholder groups (students, parents, team managers, and directors) are included in Appendices A through D respectively, and they are summarized here. (The Evaluation Team interviewed the DI Board of Directors and this interview is described below.)

In sum, the survey results show high program satisfaction with the outcomes of the program and program operation among all primary stakeholders. Each group of primary stakeholders overwhelmingly report that the DI program teaches students a “great deal” about the skills associated with creativity, creative problem solving, critical thinking, team work, and leadership. These stakeholders reported that Central Challenges and Instant Challenges at

Tournaments are most helpful to the development of these skills. Words frequently used to describe the strengths of the DI program include creative, fun, challenging, rewarding, fulfilling, exhausting, and awesome. DI students and parents report that Team Managers provide significant support in the program, even more so than parents.

Overall, school personnel are not viewed by stakeholders as significantly contributing to positive program outcomes. Survey participants also responded that areas for DI program improvement include, among others, making tournaments and appraisers more fair for all, improving participation among minority students and in poor and rural areas, reducing the formulaic nature of instant challenges, providing additional training for team managers, reducing costs associated with tournaments, and increasing feedback from appraisers.

In October, 2010, a member of the Evaluation Team conducted an in-depth interview with representatives of the Board of Directors (BOD). During the interview, these individuals were asked to reflect on the strengths and weaknesses of the program from conception through implementation. Overwhelmingly positive comments from the BOD reflected strong assessments that from their perspective involvement in DI increased creative problem solving abilities, teamwork, and critical thinking. They emphasized the energy students brought to the tasks, the value of the learning in creating leaders among the participants, and the value of learning that others have an impact on one's individual success. They stressed the personal observations they had of students in the program ("an N of one over and over") who had shared life experiences after completing their DI experience. The DI BOD representatives noted that students develop a "can do attitude" that they take forward into later school and career experiences and that the experience had changed the students world view. Other noted outcomes in the affective realm were: greater self-confidence, greater comfort with public speaking and speaking with adults;

knowing how to capitalize on strengths, realization that a problem can be solved effectively even when “you don’t have the best of everything,” courage, collaboration, intrinsic motivation, and persistence.

Among areas where they felt improvements could be made were:

- improvement of the training of Team Managers in Creative Problem Solving Skills; some noted concerns that DI was regarded by too many TMs as a club rather than as a learning environment
- seeking ways to impact larger numbers of students; particularly those from low income and ethnically diverse families where parents and/or teachers are not able to provide the volunteer support for teams in terms of time or energy or who are not reached through current public outreach efforts; they suggested seeking ways to make DI less volunteer dependent and perhaps shortening the “season” of DI to encourage greater volunteer participation as Team Managers; developing sponsorships to make participation affordable; and to disassociate from the “gifted program” label
- seeking greater collaboration with existing child centered groups who now don’t seem to be aware of DI possibilities (e.g., Girl Scouts)
- improve communication with all levels of volunteers (clearer and more encouraging)
- collection of data on “what works” from the development and support of teams to effective learning practices
- making inroads in helping schools see the importance of teaching creative problem solving

- greater longitudinal data collection
- need to distinguish DI from OM.

There was no consensus on reaching a common pricing for DI participation, but recognition of the unevenness and the potential inhibition that cost may have on participation. On the other hand, some feared undervaluing the experience.

General Question 2:

Does participation in the activities and tournaments provided by DI contribute to the development of creative thinking skills in the students who participate in those activities and tournaments?

To answer this question, the Evaluation Team administered or coordinated the administration of two assessments. The first was the TTCT – Verbal, which is a divergent thinking test used to assess the quantity and quality of creative ideas produced by the test taker. Divergent thinking as conceived by the TTCT includes three components of creativity including Fluency (the ability to generate many creative ideas), Flexibility (the ability to generate conceptually different ideas and solutions), and Originality (the ability to generate novel or unique ideas). The second was a performance task called Monkey in Motion. Results from the Monkey in Motion performance assessment, which inform the answers to General Questions 2 through 5, are discussed separately in response to General Question 5.

Responses to the stakeholder surveys also inform results for this question, with stakeholders overwhelming reporting the belief that participation in the activities and tournaments provided by DI contribute to the development of creative thinking skills in the students who participate in those activities and tournaments. Survey results are discussed more fully in response to General Question 1, and are attached in Appendices A through D.

Torrance Test of Creative Thinking -- Verbal

Sample: The sample of participants taking the TTCT consisted of 251 middle and high school students born between 1995 and 1999. Six students were home-schooled, six attended private schools, and the rest attended public schools. Participants were recruited by a member of the Evaluation Team in Virginia and by State and Regional Directors in Texas, California, and Illinois. Participants came from eight school districts in Virginia, four school districts in Illinois, two school districts in Texas, and four school districts in California representing varied geographic regions and community sizes (metropolitan, suburban, and rural). Participants from California are notable in that they consist almost entirely of students participating in an advanced language arts program and who were identified gifted students under the State of California's Gifted and Talented Education (GATE) program. Participants who participated in the DI program were purposely sampled in these school districts as were comparable peers in terms of race, gender, and academic ability who had not participated in the DI program. 251 students (113 DI and 138 non-DI participants), including 37 students from Virginia, 48 students from Illinois, 84 from California, and 86 from Texas, took the TTCT -- Verbal.

Results: The TTCT – Verbal produces three subscale scores: Fluency, Flexibility, and Originality. The mean of these three subscale scores is the overall verbal creativity score, called the Battery Average. The TTCT – Verbal reports these scores as standard scores, with a mean of 100 and a standard deviation of 20. Thus, approximately two-thirds of individuals who take the TTCT – Verbal will receive scores ranging from 80 to 120.

Using independent samples *t* tests, results for the TTCT – Verbal showed statistically significant ($p < .05$) higher mean scores for students who participated in the DI program than non-DI students on the Battery Average ($M = 112.19$; $M = 106.6$) and Flexibility scores ($M = 107.79$; $M = 101.28$). Although students who participated in the DI program had higher mean

scores than non-DI students on Fluency ($M = 110.06$; $M = 104.7$) and Originality ($M = 118.81$; $M = 113.89$), these differences were not statistically significant.

It should be noted that when analyzed separately by state, only DI students from California showed statistically significantly higher mean scores than students who did not participate in DI at the $p < .05$ level. These statistically significant differences were seen in the Battery Average scores ($M = 126.04$; $M = 117.11$) and across all subscale scores for DI program students as compared to non-DI students including Fluency ($M = 127.46$; $M = 116.91$), Flexibility ($M = 118.11$; $M = 110.41$), and Originality ($M = 132.82$; $M = 124.13$). While participants from Virginia, Illinois, and Texas who participated in DI also had higher mean scores than participants who had not been involved in the DI program, these differences were not statistically significant. Moreover, the mean scores for California participants (both DI and non-DI) are significantly higher than mean scores for Virginia, Illinois, and Texas participants (CA $M = 120.08$; VA $M = 92.19$; IL $M = 115.15$; TX $M = 101.99$). The differences between California and Virginia test takers are particularly dramatic with average scores differing by nearly 1.5 standard deviations. It is possible that these differences are attributable to the particular characteristics of the sample from each state.

General Question 3:

Does participation in the activities and tournaments provided by DI contribute to the development of critical thinking skills in the students who participate in those activities and tournaments?

To answer this question, the Evaluation Team administered or coordinated the administration of two assessments including the CCTT -- Level X and Monkey in Motion (discussed below). The CCTT conceptualizes “critical thinking” as “a reasonable and reflective thinking focused on deciding what to believe or do.” A student’s critical thinking ability represents a composite of a

number of skills associated with critical thinking, including induction, deduction, evaluation, observation, credibility (of statements made by others) assessment, assumption identification, and value judging. There are 71 multiple choice questions on the CCTT.

Responses to the stakeholder surveys also inform results for this question, with stakeholders overwhelmingly reporting the belief that participation in the activities and tournaments provided by DI contribute to the development of critical thinking skills in the students who participate in those activities and tournaments.

Cornell Critical Thinking Test – Level X

Sample: The sample of participants who took the CCTT consisted of 219 middle school students (102 DI and 117 non-DI participants) born between 1995 and 1999, including 38 students from Virginia, 3 students from Illinois, 96 from California, and 82 from Texas. All students attended public schools. Participants were recruited by a member of the Evaluation Team in Virginia and by State and Regional Directors in Texas, California, and Illinois. Participants came from eight school districts in Virginia, one school district in Illinois, two school districts in Texas, and four school districts in California representing varied geographic regions and community sizes (metropolitan, suburban, and rural). Again, participants from California are notable in that they consist almost entirely of students participating in an advanced language arts program and most were identified gifted students under the State of California's Gifted and Talented Education (GATE) program. Students who participated in the DI program were purposely sampled in these school districts as were comparable peers in terms of race, gender, and academic ability.

Results: Results for the CCTT showed statistically significant ($p < .05$) higher mean scores for DI participants than non-DI participants ($N = 102, M = 47.02; N = 117, M = 42.85$). When

analyzed separately by state, DI students from both Virginia ($N = 19$; $M = 48.47$) and California ($N = 39$; $M = 48.64$) showed statistically significantly higher mean scores than students who did not participate in the DI program from Virginia ($N = 19$; $M = 41.26$) and California ($N = 57$; $M = 43.16$). Although students from Texas who had participated in the DI program had higher mean scores on the CCTT ($N = 41$; $M = 44.39$) than those who had not participated in DI ($N = 41$; $M = 43.15$), this mean difference was not statistically significant. (Only 3 students from Illinois, each of whom were DI students, participated in this assessment and thus t could not be computed.)

Unlike the results seen for the TTCT, participants from California did not show significantly higher scores than those from other states on the CCTT.

General Question 4

Does participation in the activities and competitions provided by DI contribute to the development of creative problem solving in the students who participate in those activities and tournaments as measured by a performance assessment?

General Question 5

Does participation in the activities and competitions provided by DI contribute to the development of the skills of effective teamwork in the students who participate in those activities and tournaments?

To answer this General Questions 4ⁱ and 5, the Evaluation Team administered or coordinated the administration of a team-based, creative problem solving task called Monkey in Motion. Monkey in Motion asked students in teams of two to seven members to use a variety of materials and together develop a creative means of propelling a monkey along the length of an eight foot string. Multiple solutions to the problem existed. Teams had a period of time to develop a creative solution to the problem posed, the opportunity to describe their solution, and a five minute period to attempt their solution. The Evaluation Team selected this task for the

evaluation because it reflects the kind of task that DI incorporates into the program in its Instant Challenges.

Responses to the stakeholder surveys also inform results for these questions, with stakeholders overwhelmingly reporting the belief that participation in the activities and tournaments provided by DI contribute to the development of teamwork and creative problem solving skills in the students who participate in those activities and tournaments.

Monkey in Motion

Sample: The sample of participants in the MiM task consisted of 105 students (59 DI participants and 46 non-DI participants) born between 1995 and 1999. The 105 students made up 23 teams comprised of 2 to 7 team members. 15 teams consisted of students from Virginia (8 DI teams and 8 non-DI teams). Participants from Virginia were purposely sampled. Some participants attended a summer enrichment program for gifted students operated by the University of Virginia. Others were recruited by the Evaluation Team and through solicitations from the Virginia State Directors. One team consisting of five DI participants was recruited by the Illinois State DI Director. Six teams (3 DI teams and 3 non-DI teams) consisting of 40 students were purposely sampled and were students at the school where the Texas State DI Director works.

Results: MiM was scored by a member of the Evaluation Team and a graduate student at the University of Virginia, Curry School of Education. Scorers were not aware of the DI status of the participants in this component of the evaluation. Scoring for the MiM creative problem solving task produced 5 scores, Creativity (Cr), Problem Solving (PS), Critical Thinking (CT), Teamwork (Tw), and Distance (Di), as well as a total score (TS) which represented an aggregate

of the five scores. Teams could receive one to five points on each component and up to 25 points for a total score.

Results for the MiM creative problem solving task showed statistically significant ($p < .05$) higher mean scores on all scores, including total score, except teamwork ($N = 102, M = 47.02$; $N = 117, M = 42.85$) for DI participants ($N = 59, M TS = 18.76, M Cr = 3.64, M PS = 3.8, M CT = 4.08, M Di = 3.32$) than for non-DI participants ($N = 46, M TS = 15.02, M Cr = 3.04, M PS = 2.74, M CT = 3.04, M Di = 2.54$). What is notable about these results is that it is the only assessment which compares DI teams and non-DI teams in the area of teamwork, and the single component on which DI participants did not outperform non-DI participants was teamwork.

CONCLUSIONS AND LIMITATIONS

The purpose of this evaluation was to examine the DI program's effectiveness, impact, and participant satisfaction in areas relating to creative problem-solving, creative and critical thinking, teamwork, and leadership. As reflected in the results section, the primary stakeholders in the DI program reported wide satisfaction with the outcomes of the program and program operation in all of these areas. Moreover, stakeholders strongly believe that the DI program contributes to the development of skills associated with creativity, problem solving, and critical thinking in the students who participate in those activities and tournaments. Results from the Torrance Test of Creative Thinking – Verbal, Cornell Critical Thinking Test, and the Monkey in Motion creative problem solving task add evidence to support these beliefs. Students who participated in the activities and tournaments provided by DI outperformed comparable students who had not participated in DI on assessments measuring creative thinking, critical thinking, and creative problem solving. While very positive and encouraging, the conclusion that these

differences are attributable to participation in the DI program has notable limitations. First, it is possible that students who participate in the DI program are more creative and more skilled in problem solving and critical thinking to begin with, and are therefore attracted to the DI program. Second, no pretest/posttest comparison was made which could demonstrate an improvement in these skills following such participation. Third, the sample was not randomly selected limiting the generalizability of findings.

RECOMMENDATIONS FOR FUTURE RESEARCH AND PROGRAM

EVALUATION

In support of DI's stated commitments to continued research and evaluation of program effectiveness, impact, and participant satisfaction in program areas relating to creative problem-solving, creative and critical thinking, and teamwork, the Evaluation Team recommends several areas for additional inquiry. First, the Evaluation Team suggests that DI evaluate students in these areas using a pre-test/post-test comparison group. If statistically significant improvements are seen in students after they participate in the DI program in the areas described above, one could make a stronger argument that those differences are attributable to participation in DI. It would also be possible to obtain additional data from the students who participated in this evaluation indicating number of years of participation in the DI program. From this data, DI could compare performance on the assessments based on length of time in the program.

Second, the Evaluation Team recommends determining whether a correlation exists between creativity test scores and critical thinking test scores to generate improved understanding of the relationship between divergent thinking and critical thinking and the degree to which skills associated with these constructs can be taught through the DI program.

Third, the Evaluation Team recommends determining whether a relationship exists between creativity and critical thinking test scores on the one hand, and participation in gifted programs or advanced academic programs on the other, on DI program outcomes.

Fourth, the Evaluation Team recommends that DI further evaluate, through surveys and in-depth case studies of teams and Team Managers, which approaches and strategies for the development of creativity, team building, and problem solving skills contribute most positively to satisfaction in the program and to the development of skills associated with creative problem-solving, creative and critical thinking, teamwork, and leadership.

In any future research and evaluation of DI program effectiveness, impact, and participant satisfaction, the Evaluation Team notes in conclusion that one assumption of the evaluation -- the assumption of significant support and involvement from all DI stakeholders including specifically the DI Board of Directors, DI Directors, DI Team Managers, and DI students and parents of students -- did not hold at all phases of the evaluation. Starting with the survey phase of the evaluation through the assessment phase, the Evaluation Team experienced significant difficulty recruiting participants for the evaluation. Team Managers, DI participants and parents of those participants were overall far less willing to assist in the evaluation than had been anticipated by DI at the outset of the evaluation. The Evaluation Team concludes that these stakeholders are committed to the tournaments and activities of the DI program, but not necessarily in program evaluation and research. Consequently, further research and evaluation involving large school districts (such as those in Texas and California) with school personnel willing to make large numbers of students available is strongly recommended. Alternatively, recruitment of participants through DI directly, rather than through outside evaluators, is recommended.

Finally, the Evaluation Team wishes to acknowledge adequate, ongoing, and open communication between the DI program personnel requesting the evaluation and the Evaluation Team throughout the evaluation. The consistently satisfactory communications enhanced and ensured the effectiveness of the evaluation at all phases.

ⁱ Question 2 mirrors question 4, but question 4 was addressed with a different outcome measure