

**TEST:UP Year 3 External Evaluation Report**  
**External Evaluator: Shannon K. Gilmartin, Ph.D.**  
**May 2011**

**I. Introduction**

This report summarizes findings and recommendations from the TEST:UP Year 3 External Evaluation Site Visit and Program Review. TEST:UP is a comprehensive initiative designed to promote student success and transfer in STEM fields at three institutions in Southern California: Mt. San Antonio College (MtSAC) (2-year institution), Santa Ana College (SAC) (2-year institution), and California State University Fullerton (CSUF) (4-year institution). The initiative is funded by a five-year National Science Foundation STEP grant ([http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5488](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5488)). Previous external evaluation reports have described the initiative's background, design, and components at the three TEST:UP campuses. This year's report is focused on a general assessment of the initiative's progress at its midpoint (Part II), and recommendations for the balance of the initiative, i.e., what are the strategies and innovations that TEST:UP should zero in on to maximize its **intellectual merit** and **broad impact** in the last two years of the funding period (Part III)? The report concludes with a broad recommendation for practice (Part IV).

For this report, I conducted meetings with the following TEST:UP team members during and after a two-day site visit in April 2011 (see Appendix A for protocols by campus):

- Mark Filowitz, TEST:UP PI, California State University Fullerton
- Rochelle Woods, TEST:UP Co-PI, California State University Fullerton
- Martin Bonsangue, TEST:UP Co-PI, California State University Fullerton
- Cathy Fernandez-Weston, Coordinator, STEM Transfer Student Services, California State University Fullerton, Mt. San Antonio College, Santa Ana College
- Ricardo Lopez, Coordinator, Student Success Programs and Assessment, California State University Fullerton
- Sean Walker, Associate Professor of Biology, California State University Fullerton
  
- Carol Comeau, TEST:UP Co-PI, Santa Ana College
- Kathy Takahashi, Professor of Biology, Santa Ana College
- Tammy Camacho, STEM Counselor, Santa Ana College
  
- Larry Redinger, TEST:UP Co-PI, Mt. San Antonio College
- Iraj Nejad, TEST:UP incoming Co-PI, Mt. San Antonio College
- Oscar Flores, STEM Counselor and TEST:UP Project Coordinator, Mt. San Antonio College

I also have been involved in ongoing document review for the grant, inclusive of TEST:UP's NSF reports, supporting material from each campus, and methods and findings from TEST:UP's current research studies. I draw from all of these data sources for this evaluation. (Appendix B lists plans for Fall 2011 evaluation activities and follow-up to this report.)

**II. TEST:UP Progress at the Midpoint**

The TEST:UP team prepared an informative overview of the grant's activities to date for the recent Year 3 NSF review (March 2011).<sup>1</sup> Points in this section are designed not to duplicate what has already been reported, but to summarize and assess what I observed and learned throughout my April site visit at each campus. At the end of this section, I consider progress towards the overall goals of the initiative: increasing STEM majors, degrees, and transfers.

### ***Mt. San Antonio College (MtSAC)***

- For the first two years of the initiative, TEST:UP funding was underutilized at MtSAC (in part, I'm told, because some TEST:UP activities, e.g., Supplemental Instruction [SI], were well underway at MtSAC prior to the grant). This resulted in repurposing of funds initially dedicated to this campus. Heading into Year 4, however, the initiative will see renewed energy, according to all members of the TEST:UP team here. There is appreciation for the fact that this grant represents an investment in MtSAC, with expected benefits to student learning, transfer, and success. It is also understood that by the end of the TEST:UP funding period, MtSAC will need to articulate the impact of this investment on its STEM community.
- Iraj Nejad is the incoming Co-PI at Mt SAC, taking over for Larry Redinger. Nejad has longtime experience with the NSF (as both a PI for NSF grants and an NSF Program Officer). His expertise will be enormously valuable as TEST:UP activities pick up speed, at MtSAC and at the partner institutions.
- Although SI has been implemented at MtSAC for some time, the team foresees more rigorous assessment of SI impact going forward. The team is eager to align assessment methods with those at SAC and CSUF, e.g., collective examination of the extent to which SI impact varies by students' academic background (using the same measures and analytic techniques across campuses). MtSAC will be looking to SI assessment leaders Martin Bonsangue and Sean Walker at CSUF to help shape these analyses.
- STEM counseling at MtSAC has increased, i.e., Oscar Flores reports an increasing number of STEM students visiting his office, and a greater number of STEM transfer-preparation activities and events, e.g., a "Personal Statement Party" in November 2010. We talked about the difficulty of identifying which institution transfer students actually transfer to—a recurrent theme across all TEST:UP meetings over the past three years. Transfer data are currently incomplete and/or ad hoc. (This is not a problem unique to TEST:UP, of course—the data system is limited state- and nation-wide.) However, counselors such as Flores have developed a solid network of colleagues at four-year campuses in California; these networks might be leveraged to start to develop a more comprehensive tracking system.
- Relatedly, Redinger has personally collected major, degree, and transfer data for the Year 3 NSF report, from all available sources. He and Nejad agree that the resulting counts are conservative. How can this process become more systematized and precise in the future? MtSAC, in partnership with SAC and CSUF, will need to come together on this topic and brainstorm about processes and procedures for transfer data.
- In terms of sustaining and promoting student diversity among STEM majors and potential transfers, Redinger emphasizes the value of having a diverse counseling and instructor team at MtSAC. This is important and consistent with the literature in this area. TEST:UP is following through on "best practices" in talent expansion. The next step is to address impact: to what

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<sup>1</sup> At the time of this writing, the team was waiting on NSF feedback to their Year 3 report. I anticipate meeting with PI Mark Filowitz to discuss next steps upon receipt.

extent is there evidence that STEM counseling and STEM SI are benefitting students who would otherwise not access/benefit from these kinds of supports and services?

- The STEM facilities at MtSAC create a rich learning environment to which TEST:UP can contribute. MtSAC needs to identify, implement, and assess those contributions in the next two years. Part of this, notes Redinger, will depend on increasing MtSAC faculty buy-in for the objectives and activities of the grant. Redinger and Nejad will be convening faculty in the coming months to heighten community awareness of the initiative.

All in all, MtSAC is still ramping up implementation of TEST:UP. There is an excellent foundation on which to build—beautiful facilities, a well-established SI program, leadership with NSF experience, STEM counseling in place. MtSAC must now fully develop TEST:UP’s role and impact on campus. It is a “now or never” moment.

### ***Santa Ana College (SAC)***

- According to members of the TEST:UP team at SAC, TEST:UP activities have sparked a cultural shift at this campus. STEM fields, careers, faculty, and advising have greater visibility than ever, thanks to pushing forward on TEST:UP programming (STEM transfer counseling, STEM community events) and Co-PI Carol Comeau’s commitment to bringing math and science to the forefront of conversation. Comeau also reports greater involvement in data collection, research, and assessment activities as a result of the grant, which has led to new insights into the degree-seeking and transfer behavior of SAC students. As an example, Comeau finds that when transfer and AA data are disaggregated and trends are examined separately, it becomes apparent that associate’s degree numbers reflect a different set of motivations, and often different students, than do transfer numbers at her campus.<sup>2</sup> These kinds of insights, grounded in the data, are extremely important to the TEST:UP story, given that TEST:UP aims to increase both degrees and transfers at the two-year sites, and to learn/report about the processes that support these outcomes.<sup>3</sup> (In conversations with MtSAC, I learned that degree and transfer behaviors may “look” a little differently than they do at SAC—there is clearly a paper to be written about where and how associate’s degree completion fits into the transfer supports that TEST:UP is designing, no doubt soon to interface with the new California transfer degree legislation, SB 1440.)
- There is a developing sense of mission surrounding TEST:UP and related initiatives at SAC—a commitment to the idea of math and science achievement, and STEM degree attainment/transfer, as a means to improving students’ learning, career, and even social and economic outcomes. TEST:UP also has encouraged Comeau to tie back to the idea of “science on display”, a lesson learned from her involvement with the Project Kaleidoscope (PKAL) community (<http://www.aacu.org/pkal/>). Articulating the conceptual underpinnings of grants like TEST:UP, aligning with institutional mission, connecting to academic literature and national conversations, creating a “lineage” for STEM transformation efforts at SAC: these are highly effective strategies to raise awareness of, if not institutionalize TEST:UP innovations. Relatedly,

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<sup>2</sup> Numerically, the associate degree trend at SAC has been fairly flat over time, while the transfer counts have increased (see SAC’s protocol in Appendix A). Comeau attributes this in part to “lack of perceived value” of the associate’s degree among students who are planning to transfer.

<sup>3</sup> In fact, these metrics (associate’s degrees and transfers) were proposed in the aggregate in the original TEST:UP proposal, and are reported in the aggregate in current documentation for the NSF. Going forward, reporting these metrics separately (in addition to aggregate reporting) may merit some thought given what we are learning.

SAC is in the process of applying for other grants in STEM domains—a key way to extend the life of TEST:UP and build on the STEM momentum here.

- STEM faculty engagement has been essential to the grant’s progress at SAC (supporting Larry Redinger’s call for more faculty buy-in at MtSAC). I learned that faculty themselves have become more aware of the intricacies of transfer and degree attainment as a result of their TEST:UP participation. This is a nice and perhaps unexpected outcome of the grant: increasing faculty awareness and understanding of the broader STEM educational pipeline. TEST:UP, in other words, might strengthen more than the connection between “student” and “transfer”—it also strengthens connections between “faculty” and “policy”, “counseling” and “administration”, “community” and “STEM”, and so on.
- SI has been expanding at SAC, and SI assessment has been expanding too. Like her colleagues at MtSAC, Kathy Takahashi is eager to develop these analyses in ways concordant with what’s happening in SI assessment at CSUF. She is considering how to implement a baseline instrument or “pre-test”, as well as the possibility of longitudinal follow-up of students who participate in SI. Do they continue to show success in their STEM coursework, as compared to non-SI attending peers? Can we make any inferences about long-term impact of the SI experience? This is a conversation that will be enriched by cross-institution dialogue.
- Just as Oscar Flores at MtSAC relays, Tammy Camacho reports a steadily increasing number of students whom she counsels and who seek out STEM-related events and information. Camacho’s office, which also houses Cathy Fernandez-Weston when she is on campus, is directly adjacent to the Dean’s Office—an impressive location with high cultural, social, and practical value. Camacho notes that she would like to improve the process by which she logs and tracks information for students who visit her. This next step will be imperative for SAC as it builds evidence that these supports are effective.
- SAC is distinguished as one of the top ten Hispanic-serving two-year institutions in the U.S. Comeau, Fernandez-Weston, and I talked about the extent to which the STEM-specific population at SAC is reflective of the broader student population, and the extent to which targeted STEM supports are accessed by a representative range of STEM students. This is a second next step for SAC: assessing the extent to which TEST:UP and related activities and culture shifts are improving the participation and success of STEM students from historically underrepresented backgrounds. SAC is positioned to make a huge contribution in this area given their diverse student population and nationally recognized service to the Latino/a community.

In all, SAC is showing continuing momentum as a TEST:UP partner institution. They will benefit from continued efforts to collect and examine student-, course-, and program-level data. Their models for program development, data collection and analysis, and cultural transformation may be scalable to other, similar two-year institutions, which is an exciting potential outcome of this initiative.

### ***California State University Fullerton***

- TEST:UP’s progress at CSUF is evident in three major areas:
  1. Research. Under PI Mark Filowitz’s supervision, the TEST:UP team has rolled out three new research initiatives in a little less than a year: the STEM Pre-Transfer Survey (administered to STEM students at the two 2-year partner institutions); the STEM Post-Transfer Survey (administered to STEM transfer students at CSUF); and the Transcript Project (a retrospective analysis of transcripts for transfer students in CSUF’s Natural Sciences and Mathematics [NSM] and Engineering and Computer Science [ECS] colleges). Ricardo Lopez was hired to collect and analyze data for all three projects

earlier in the year; thanks to Filowitz, Lopez, and others continuing to push forward and problem-solve the many kinks and challenges in this type of data work, the three studies have covered a remarkable amount of ground in a short period of time. Once basic analyses of each dataset are conducted, triangulating and integrating these three datasets into “macro intelligence” on the transfer experience will be critical. Together, these studies represent a significant step forward for TEST:UP in terms of building the evidence base for this and successive grants at the institution.

2. SI. The SI component of TEST:UP, led by Co-PI Martin Bonsangue and Sean Walker, has consistently been a “hot spot” of TEST:UP activity since the grant began. Bonsangue and Walker continue to collect data on the performance of SI students; they note that Summer 2011 will be the time to start consolidating their findings both within and across departments, and translate these data into conference presentations and papers, thus providing additional material for the TEST:UP evidence base. We also discussed the importance of convening regular meetings with SI analysts at MtsAC and SAC, to be able to align assessment across campuses and include the two-year data in these presentations. This is a particularly unique area of contribution for the SI research effort.
  3. Transfer student support: STEM counseling and the Early Warning System. Cathy Fernandez-Weston has implemented a brand-new system to provide support for STEM transfer students at CSUF, known as the Early Warning System. This system asks willing faculty to report on the academic performance of transfer students early in the semester, identifying students who may be “in trouble”. This flag activates alerts to these students from Fernandez-Weston’s office, a practice that has generated both positive and negative feedback from the students themselves (e.g., some students relay that they do not like being “tracked” and resent the oversight). The TEST:UP team is learning from this bold experiment and is planning to refine the system over time; Fernandez-Weston is also considering how to reinforce faculty’s positive recognition of students who are doing well in their courses. Although the system may not, in its current form, outlast the grant, it has generated a good amount of interest among colleagues in other colleges, and represents an extremely valuable opportunity to learn about what works, what might not work, and why.
- TEST:UP team members are thinking ahead to the end of the grant and the extent to which some or all of TEST:UP innovations, supports, and services (SI, STSS, etc.) can and should be institutionalized at CSUF. Reaching out to other members of the campus community to compare and synchronize efforts will be essential to this process, as will a thorough and rigorous internal/external evaluation of TEST:UP practices that appear to yield the highest returns in terms of both educational and cultural value. As at SAC, there are several new grant proposals in the works at NSM that build on TEST:UP, which is a key project outcome to emphasize, and can facilitate institutionalization efforts.
  - ECS has been formally brought into the fold for this grant somewhat later than planned<sup>4</sup>; the same is true of the teaching intern component (see original TEST:UP proposal). Both fronts are developing well, now that they are underway; to what extent will these efforts add to TEST:UP’s impact at CSUF given their late start? Where will each “fit” into the final TEST:UP story?

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<sup>4</sup> Since the beginning of the grant, ECS students have been represented among those who are counseled by STSS, given the math and physics requirements of their curriculum. The “later start” for ECS refers to more formal, administrative engagement with the grant and with respect to SI.

- The TEST:UP team at CSUF is meeting regularly to discuss components of the grant. It is important to continue these regular conversations as the research ramps up and the initiative heads into its final two years, to maximize “checks and balances” and ensure a strong feedback loop.<sup>5</sup>
- As of my site visit, team members were starting to think about ways to show how TEST:UP has impact on the participation and performance of a wide range of students from diverse backgrounds. Is the TEST:UP student “universe” reflective of the richly diverse student population at CSUF? (And to what extent are STEM students as a whole representative of the CSUF population?) Ultimately, we will want to show how the initiative reached target populations and improved opportunity and access for students who have been underserved in “status quo” educational environments.

In all, CSUF is continuing to implement and refine TEST:UP innovations, and is gathering a tremendous amount of information about its STEM transfer student population, STEM student success, STEM faculty attitudes towards and engagement in transfer student achievement, and institutional and cross-institutional processes and collaborative opportunities in these areas. To the extent that it can now move this information into a suite of rigorously analyzed pieces for dissemination, while continuing to hone its core work and advise others on future and related grants, it will be well positioned to make statements about impact. CSUF also needs to engage further in the research and assessment activities at MtSAC and SAC, a point I expand on in Part III.

#### ***Overall: Meeting the Metric-Based Goals of the Grant***

- At the time of the proposal, TEST:UP projected gains in STEM majors, associate’s degrees, transfers, baccalaureate degrees, and retention as a result of its multi-institutional, multi-dimensional set of strategies and innovative practices. These metrics are intended to provide proof of concept. Progress in collecting these data was relatively slow in the first two years of the grant, but this third year has seen an impressive pick-up. The PI/Co-PIs are learning one another’s methods and calculations, a conversation I strongly encourage them to continue.
- Looking at the numbers in the recent Year 3 NSF report, the trends are positive. New STEM majors at the two-year institutions has increased by 25 percent since the 2007-08 baseline year (from 1,731 in 2007-08 to 2,168 in 2010-11), exceeding targets. The combined AA/transfer numbers are meeting targets, from 691 in 2007-08 to 795 in 2009-10 (although see earlier points about precision of transfer data, and how aggregating associate’s degrees and transfers may mask important differences that could advance understanding of these processes). Since 2007-08, retention of first-time first-year students at CSUF has increased in both NSM and ECS (where retention is calculated as percentage of students who remain in major on a year-to-year basis); retention of transfers has held steady in NSM and increased in ECS.<sup>6</sup>

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<sup>5</sup> As a quick procedural suggestion, minutes might be taken at these meetings and distributed to attending and non-attending team members. This keeps the channels of communication open and is good documentation practice. (As part of my own evaluation activities, I too would like to review meeting minutes if instituted—detailed minutes are not necessary, only a broad overview of major decisions.)

<sup>6</sup> Going forward, I would like to see retention rates for single cohorts over a multi-year period, e.g., one-, two-, three-year retention rates for all transfer students entering in 2007-08, and so on. Year-to-year retention rate does not capture changes in inputs in any given year. These longitudinal cohort data might be cut by incoming academic preparation (drawing from findings of the transcript study) as a way to test hypotheses about differential retention patterns.

- Given the differential start times of TEST:UP activities at each of the major sites/partner institutions, it is a bit unclear how much TEST:UP can help to explain trends to date. On the other hand, the numbers indicate fertile ground for TEST:UP across all sites, i.e., a community of students, faculty, staff, and administrators who are “on the move” in these STEM environments and nicely positioned for the kinds of supports that TEST:UP can offer. TEST:UP needs to capitalize on these moments and accelerate the pace of change. The overarching goal is for MtSAC, SAC, and both NSM and ECS at CSUF to situate their degree, transfer, and retention trends in the context of TEST:UP by the end of the funding period.

### III. Recommendations for Upcoming Years

In this section, I make a series of big-picture recommendations **to maximize the intellectual merit and broad impact of TEST:UP as it looks ahead to Years 4 and 5**. These recommendations build on what I report and suggest above.

1. Collecting the key TEST:UP metrics is underway at each campus. **Now the cross-campus team must meet and share methods, develop the systems used to collect these data, and continue to innovate on the transfer metric in particular.** If TEST:UP, by the end of the grant, can show how they improved on the process by which student transfer is both tracked and understood, it will be making a tremendous contribution to the academic literature and to the community of practitioners and policymakers in this area. SAC, more so than MtSAC at this time, has a systematic methodology for data capture; which additional data capture and QA mechanisms can be put into play to check these data and build a more comprehensive transfer student database?<sup>7</sup> I could see Filowitz, Comeau, and Nejad convening an all-team summit to brainstorm about these data issues (see recommendation 2e, below, for more on a proposed “data summit”).
2. Research on transfer students is underway at CSUF, in partnership with MtSAC and SAC. Progress has been made on three large studies. The scope of each study—design, methodology, analysis, the desired “products”—is extensive. There is also the SI research effort, which is unfolding at each TEST:UP institution but has not yet been integrated fully across institutions. My recommendation for TEST:UP research is multifold:
  - a. **Convene at least one, but perhaps even 2-3 research committees and/or working groups.** These groups would serve as a sounding board for the development of the analyses, papers, and related dissemination opportunities. I could see one version of this group comprised of social scientists around the country who are themselves studying transfer and related postsecondary education issues, e.g., Frankie Santos-Lanaan, Alicia Dowd, Sylvia Hurtado, Laura Rendon, Linda Hagedorn. Having this level of peer review will greatly enhance the visibility of the initiative (keeping in mind that the current research activities are fundamentally grounded in the methods and frameworks of the social sciences). I could see another version of this group comprised of TEST:UP team members who are willing to dig deep in the data and meet regularly about sampling, statistics, and technical writing/reporting. The analytic process demands iterations, counterfactuals, and ongoing dialogue among and between the cross-

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<sup>7</sup> It has been suggested that the National Student Clearinghouse, which SAC and many other institutions currently use, does not have the most up-to-date information—what is a better source/strategy?

disciplinary TEST:UP team members. I could see still a third version of this group dedicated to reviewing and writing up relevant literature in the areas of TEST:UP—a weekly or monthly “journal club” for instance, where citations and abstracts are regularly logged into a TEST:UP literature database. This group would also help to position each study within a strong conceptual framework (see recommendation 3, below) and flesh out the implications of study findings for policy and practice. Note that this recommendation includes the transfer student studies and the SI studies at all three institutions—all of these efforts can benefit from more conversation and collaboration between and among analysts, and working groups that meet at a dedicated time and location.<sup>8</sup>

- b. **Identify where and how qualitative research methods might be introduced to expand on the quantitative findings.** Interviews with transfer students before and after transfer is an obvious possibility. This does not have to be a large qualitative study—only 10-20 interviews, for instance, might be needed to turn up the volume on particularly suggestive trends in the quantitative data. The qualitative data, in turn, can point to new directions for the quantitative analyses, as part of TEST:UP or in future initiatives.
- c. **Ensure that the appropriate resources have been dedicated to these activities.** And if existing resources are tight, start thinking about people and sources outside of TEST:UP that can help to augment the efforts—CSUF’s IR Office, sociology graduate students at CSUF, UCI, or UCR, small research grants through local foundations—and/or refining the scope of these projects such that analyses, if fewer in number, are thoroughly developed. Identify where and when less is more.
- d. **Document the methods for each study as soon as possible, in ways that can easily be transferred to journal articles, presentations, chapters, and so on.** Methods sections include information about instrument design (piloting, psychometrics), sampling, analytic techniques, codes/categories and/or dependent and independent variables, etc. Methodologies themselves can be the subject of compelling white papers and conference presentations—people are eager to learn how to do research in the kinds of environments that TEST:UP is in.
- e. **Convene a “data summit” or “data retreat” that includes all members of TEST:UP across all three institutions, to discuss both the research data and the metrics that are at the heart of the grant (major, transfer, degree, retention).** This type of meeting might be a one-day event; team members would start the day together, split into smaller working groups on focused topics as the day goes on, come back for presentation and conversation, and so on, followed by a team dinner and creative activity (Lego project, etc.). This type of event leverages the very aspect that makes TEST:UP distinctive: its multi-institution, multi-component design. This is, in fact, what several team members have told me is the greatest achievement of TEST:UP, i.e., its establishment of communication and collaboration across programs, practices, departments, and campuses. TEST:UP must now tap into this achievement for the purpose of building its research and data enterprises.
- f. **Develop and commit to a dissemination plan for research methods and findings.** Identify 10 conferences to which presentations/posters will be submitted in 2011-12, and three manuscripts for submission to peer-reviewed journals. Share these plans with

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<sup>8</sup> These research committees and working groups can be reconfigured differently of course, perhaps each around a specific research question; the point is to get dedicated groups going, internally and externally, to help steer and validate the research process.



everyone on the TEST:UP team, and have an inclusive authorship model. Hold project/study leads accountable to presentation and publication deadlines, and advertise dissemination milestones via email and on campus websites.

3. Elemental to good scientific and engineering study is “drawing a picture” of the processes to be described and analyzed. Adapt this to TEST:UP. Drawing from relevant theoretical bases and empirical knowledge about STEM student transfer and success, **start to develop visual representations of TEST:UP’s processes and intended impacts, both at a “macro” level and within/relating to specific components, i.e., SI, STSS.** What would pictures of these innovations and supports look like? Ultimately, these pictures constitute the logic map for projected gains in majors, transfers, and degrees, can help to cement team understandings of the initiative, and will advance public understanding of what TEST:UP is all about. They also can ground the research efforts, providing analysts, authors, and contributors with shared frameworks for interpreting and reporting data.
4. Over the past three years of the grant, California state budget cuts have deepened, transfer requirements have changed, programs and curricula have been scaled back, and CSU faculty have had furloughs. This is a challenging context to be sure. However, TEST:UP is proving to be quite vigorous in spite of these trends. This is what is important to emphasize at this point. **While contextual qualifiers are critical to document, TEST:UP can and should focus on the positive too, and back it by good science.**
5. At the same time, and not in opposition I would argue, there are some TEST:UP innovations that will not be as effective/high-impact as others. **These lesser-impact practices need to be documented just as thoroughly as do research methods, program metrics, and so on.** Avoid the “file drawer problem” in all aspects of TEST:UP, i.e., make sure that the story helps the research and practitioner communities to see how and why each aspect of the initiative had more or less traction.
6. Several TEST:UP advisory board and team members have repeatedly suggested a regional SI conference, which would include more institutions than just the three TEST:UP partner institutions. This conference would dovetail with several recommendations above, namely 2c and 2e, helping to augment TEST:UP’s work and leverage its strengths. This type of conference also would generate much needed new thinking, collaborations, practices, and research on and about SI. **I recommend that the team start looking for additional sources of funding for this type of regional conference (including NSF sources) as soon as possible, sure to be resource- and time-intensive but with great pay-off.**
7. **Developing relationships and partnerships with other programs and grants on each of the three TEST:UP campuses should be a part of everyone’s strategic plan for these final two years.** I have heard time and time again that SI is effective in ways that few other STEM classroom interventions have been, and STEM counselors at each institution have provided expert knowledge on the STEM transfer process that is not found in any other counseling site on campus. As long as strong assessment activities continue to document the positive impact of these innovations, every effort must be made to sustain them post-TEST:UP-funding, and this can only be done by knowledge-sharing, relationship-building, and alignment/alliance with other campus units and efforts.

8. These first three years of the grant, culminating with the latest research findings from the Pre-Transfer Survey, evidence both similarities and differences between the two 2-year TEST:UP institutions. This is such an important sub-story of TEST:UP in terms of explaining how TEST:UP practices interact with different types of two-year environments. To some extent, future Pre-Transfer Survey administrations will generate more comparable samples across the two institutions, but **I also recommend that papers and presentations leverage the diversity of the partnership to broaden understanding of associate's degree attainment and transfer to a four-year institution.** Moreover, how do CSUF processes and cultures mediate the ease with which STEM students transfer to a four-year environment, and which practices at CSUF increase or decrease the likelihood of student success? What can we learn about strengthening access and equity in higher education as a result? **I could see this as a book chapter or more in a volume on STEM institutional/workforce issues, publication opportunities for which the PI and Co-PIs should be actively on the lookout.**

#### IV. Conclusions

TEST:UP is at a definitive stage in its “grant lifecycle”. It is time to sharpen approaches, conduct deep analysis, and contribute to and participate in peer-reviewed media for project and research findings. These activities can yield so many benefits to CSUF, SAC, and MtSAC departments and programs, as well as to faculty and students at each of these campuses.

My recommendations in Part III, as well as my suggestions throughout the report, are meant to provide TEST:UP with lifting-off points, ideas for papers, possibilities for processes, all designed to increase TEST:UP's visibility. Looking at my evaluation data and the progress of the initiative overall, however, I see the single most important step to getting TEST:UP to the next level as **building up the teamwork and collaboration within and across the three TEST:UP campuses, holding one another accountable to continued analysis, innovation, and action in the stated project areas.** Each campus's methods and activities should not only be transparent to one another, but designed, discussed, and examined collectively, within a context of clearly defined and common goals. In Years 4 and 5, I am looking forward to learning about the initiative's continued successes, and documenting how TEST:UP improved both the number of STEM transfers/degrees and a sense of STEM community, partnership, and shared knowledge across three diverse campuses—very much a collaboration of the future.

## Appendix A. Protocols for Site Visits by Campus

### TESTUP Year 3 External Evaluation – MT SAC Site Visit April 12 2pm-5pm Questions for Discussion

1. In the recent NSF Year 3 Review report, I see the following numbers:

#### STEM Transfers

06-07	07-08	08-09	09-10	10-11
167	177	189	226	TBA

#### STEM AAs

06-07	07-08	08-09	09-10	10-11
255	288	321	365	TBA

Historically, have you always seen more STEM AAs than STEM transfers?

2. For this report, how do you define STEM degrees? (Which fields are included?) How do you identify/define a “STEM transfer”?
3. The transfer trend is promising. How does this 4-year trend compare to a longer 10-year trend? How do these compare with where you were in 2000?
4. STEM AAs appear to be increasing. How do these numbers look over a 10-year period?
5. What are the top three factors that have influenced these trends?
6. How have TEST:UP interventions, innovations, and funds influenced these trends?
7. How have you measured TEST:UP’s influence on these trends?
8. In general, how would you describe the nature of TEST:UP’s impact so far: cultural, structural, both, or something else?
9. Which population(s) have TEST:UP programs and practices impacted most? Prospective STEM students, newly-declared STEM students, prospective STEM transfers, STEM faculty, STEM counseling and related staff, campus administration?
  - a. How have you ensured that diverse groups of students can and do benefit from TEST:UP services and supports?
10. What are your next steps as participants in this grant?
  - What are the “sore spots” and how will you address/remedy them?
  - What are the “bright spots” and how will you leverage and scale them?

**TESTUP Year 3 External Evaluation – SAC Site Visit April 12 10am-1pm**  
**Questions for Discussion**

1. In the recent NSF Year 3 Review report, I see the following numbers:

**STEM Transfers**

06-07	07-08	08-09	09-10	10-11
167	191	208	204	TBA

**STEM AAs**

06-07	07-08	08-09	09-10	10-11
44	35	38	40	TBA

I know that the 09-10 numbers may be slightly off due to a technical glitch – have you been able to resolve the glitch and update these yet? What are the updated numbers?

2. For this report, how do you define STEM degrees? (Which fields are included?) How do you identify/define a “STEM transfer”?
3. The transfer trend is promising. How does this 4-year trend compare to a longer 10-year trend? How do these compare with where you were in 2000?
4. STEM AAs appear to be holding steady. How do these numbers look over a 10-year period?
5. What are the top three factors that have influenced these trends?
6. How have TEST:UP interventions, innovations, and funds influenced these trends?
7. How have you measured TEST:UP’s influence on these trends?
8. In general, how would you describe the nature of TEST:UP’s impact so far: cultural, structural, both, or something else?
9. Which population(s) have TEST:UP programs and practices impacted most? Prospective STEM students, newly-declared STEM students, prospective STEM transfers, STEM faculty, STEM counseling and related staff, campus administration?
  - a. How have you ensured that diverse groups of students can and do benefit from TEST:UP services and supports?
10. What are your next steps as participants in this grant?
  - What are the “sore spots” and how will you address/remedy them?
  - What are the “bright spots” and how will you leverage and scale them?

**TESTUP Year 3 External Evaluation – CSUF Visit**  
**Questions for Discussion with Mark Filowitz 2pm 4/13**

11. In the recent NSF Year 3 Review report, I see the following numbers in the appended table:

**STEM Degrees Awarded at CSUF to Transfer Students**

06-07	07-08	08-09	09-10	10-11
?	223	235	213	TBA

**CC STEM Transfers to CSUF (from SAC and MT SAC combined)**

06-07	07-08	08-09	09-10	10-11
?	48	38	35	40

- a. To clarify: you would expect that the STEM degrees awarded to transfer students would NOT necessarily increase over this period due to ongoing enrollment/budget restrictions, correct? So we can actually interpret this “holding steady” trend as pretty positive? (a la “no news is good news”...)
  - b. Have you followed the progress of the incoming transfer students from SAC and Mt SAC over this time period to assess how these focal cohorts are faring at CSUF (GPA, course-taking patterns, planned graduation time, etc), assuming 0708 is your pre-TESTUP cohort, and 08-09 are your post-TESTUP cohorts? Can you use the post-transfer survey (currently being administered?) to help you do this? Are more recent transfer cohorts having qualitatively/quantitatively different experiences?
  - c. How have you tracked retention of STEM transfers (from all cc’s) over this time period—not necessarily persistence-to-degree (I see that historically, transfers require more than 2 years to complete degrees), but persistence in the major?
12. Currently, how is TEST:UP’s impact on these numbers and trends being measured? Let’s discuss the compendium of assessments – I want to be clear.
- a. Are the SI assessments flagging and analyzing transfer student performance?
13. In general, how would you describe the nature of TEST:UP’s impact so far: cultural, structural, both, or something else?
14. Which population(s) have TEST:UP programs and practices impacted most? STEM first-time full-time freshmen, STEM transfer students, STEM faculty, STEM counseling and related staff, campus administration, other?
- a. How have you ensured that diverse groups of students can and do benefit from TEST:UP services and supports?
15. What are your next steps in this grant?
- What are the “sore spots” and how will you address/remedy them?
  - What are the “bright spots” and how will you leverage and scale them?

## **Appendix B. Evaluation Activities for Fall 2011**

Following this report, I'd like to have a check-in visit in September/October 2011, where I would review all of TEST:UP's research activities and "products" to date, assessing 1) the progress of each on a methodological level and 2) how each ties in with one another and links to the goals of the grant. I would like to conduct a few interviews with TEST:UP team members to get their sense of how these research activities are going, and how they are reflective/supportive of TEST:UP mission. I will provide a short write-up of this visit, and possibly help to produce a matrix of studies that can guide further work (i.e., a grid showing study by research question, conceptual framework, method, findings, implications—producing a clear matrix ensures that there are commonalities and integration across studies for maximum impact). I can also participate in the broader data summit/workshop that I am suggesting in Part III of the report, to discuss all metrics and assessments underway in the initiative.