

Proposal to Eliminate Academic Program

Pursuant to UW Regulation 6-43

Science Math Teaching Center (SMTC)

Statement of the reasons for elimination of the program:

The SMTC, a valuable asset to the Colleges of Arts and Sciences and Education and the university, is not necessary for maintaining national accreditation, nor is it necessary to the programs or to award the degrees offered. Although advanced degrees currently awarded by the SMTC do qualify recipients for several PTSB endorsements to a teaching license, these degrees could be just as easily housed in other existing academic and administrative units in the Colleges of Arts and Sciences and Education.

In the most recent decade, the SMTC has been in a gradual, sustained, and marked descent in terms of its research productivity, national and state reputation and alignment of mission with the broader field of STEM education.

The problems with the SMTC, however, aren't to be found in these surface level productivity statistics. Instead, the problems with the SMTC are composed of an inter-related set of issues that have led us to reconsider, even re-conceptualize, the potential of the SMTC if it were to be reconfigured with a new and broader university role in STEM education, and integrated with three of the university's current initiatives, Science, Engineering, and Education. Below are reasons why the SMTC as it now stands should be eliminated and slated for updating, re-visioning, and re-establishment as a university-wide P-16 STEM EDUCATION Center at UW.

There has been a decreasing number of affiliate faculty members who choose to run their grant applications or currently funded projects through the auspices of the SMTC.

Also, SMTC's current mission lacks alignment with more contemporary conceptualizations of science and mathematics education within the broader field of STEM or STEAM disciplines on and beyond the university campus. THE SMTC has failed to modernize its mission and connect the disparate bits and pieces of faculty and staff interests in STEM disciplines into a broader university-based STEM focus. Furthermore, having failed to connect to the larger focus of STEM, both the SMTC and the university have failed to build a coherent STEM organization on the campus that is prepared with the capacity to compete for large NSF, Department of Education, NIH, and other broader impact grants and contracts. This limits the amount of potential external funding available for research in STEM disciplines and in STEM education on the UW campus.

We believe that the original intent of the SMTC was to be a grant supported entity on the UW campus and not a state funded entity. Over time, financial support evolved to include a small amount of state funding to continue SMTC's functions in lean times and then expanded when additional duties were added. The Wyoming State Science Fair has become entangled with the SMTC for example. The Wyoming State Science Fair

would be better placed in a P-16 setting such as the Wyoming Department of Education, where its efforts would be synergistic with the other statewide and UW-wide efforts for recruiting and retaining outstanding Wyoming STEM majors.

The organization of the three master's degree programs into the SMTC is a somewhat aberrant organizational practice since degree programs are typically housed in academic units such as departments and colleges and not in centers, institutes or other academic units. The current masters degree programs offered in the SMTC, although productive, can be given departmental academic homes within current or even revised university college and departmental structures. As a result, the argument that the SMTC needs to continue in its current form to support existing graduate degree programs is also questionable.

Taken together, these subtle but important internal factors we have noted here, which are unrelated to the surface level statistics of program productivity, argue that the SMTC is in need of major transformation if not a complete overhaul of mission, personnel, physical location, etc. This realization is not to impugn the many past achievements of the SMTC leadership, faculty or staff—quite the contrary. **We believe the spirit and past functions of the SMTC should be retained, enhanced, and coalesced into a cogently designed university center or institute focused on P-16 STEM Education.** The Provost's Office will work with the three current university initiatives, Science, Engineering and Education, which could be combined with the past work of the SMTC and its supporters, as well as other groups such as WYSTEM, to support a **University P-16 STEM Education Center** to be potentially housed in the new Enzi Science Facility. This would allow UW to seek and obtain broader impact grants and contracts in STEM disciplines and to support improved STEM instruction within the P-16 educational community.

Consequently, after serious deliberation, it is our recommendation that the Science Math Teaching Center (SMTC) be eliminated at the University of Wyoming. As difficult as this decision is, it has been one that has been needed for several years now and will afford the University an opportunity to consciously design a vibrant new focus on P-16 STEM Education that involves and connects the many STEM interests on the UW campus and those of the P-16 educational community.

Description of the program and relevant data:

Describe the mission, curriculum, content and format of the program:

The Science and Mathematics Teaching Center was established to provide high quality professional development for Wyoming teachers in 1970 by a group of scientists concerned about the quality of K-12 education. As a collaboration between the College of Arts and Sciences and the College of Education, SMTC currently offers three master's degree programs, engages in outreach throughout Wyoming, collaborates with faculty to expand their broader impacts by providing professional development to teachers, conducts research with external funding and coordinates the Wyoming State Science Fair.

The Science Math Teaching Center (SMTC) housed on the UW Laramie campus has had a long and distinguished history of collaboration between two colleges, research and grant productivity, statewide service and engagement, graduate degree production, and leadership in policy and practice in math and science education nationally. For nearly fifty years, the SMTC has been nurtured by scores of visionary academics, who labored to bring into existence a center where the content fields of math and the life, earth, and physical sciences could engage productively with math and science educators to meet the needs of P-16 mathematics and science educators in the state of Wyoming and beyond. For many decades the SMTC enjoyed a national reputation attracting graduate students from across the U.S. to its programs and research projects.

The SMTC at UW is dependent upon a core of strong leadership that promotes collaboration between and among internal office staff and among a group of affiliate faculty members from the Colleges of Arts and Sciences and Education. The program has graduated 78 master's degree students in the past 5 years in three graduate degree programs: Middle level science, Middle level math and Natural science education.

Graduates acquire a wealth of knowledge and competencies in this program that are transferrable not only to classroom teaching but also to leadership roles in math and science education within Wyoming, regionally, and nationally. These same graduates can, upon appropriate application, receive professional licensure endorsements through the Wyoming Professional Standards Teaching Board (PTSB) for mathematics and science education. Consequently, the degree programs housed in the SMTC are valuable assets to the Colleges of Arts and Sciences and Education. The SMTC also has an endowment of 1.3 million dollars and has generated over 10 million in external funding in the past six years.

a. Curriculum of the Concentrations in the Natural Science Major

Middle Level Science (MSC)		Credits
Summer 1	NASC 5120 Earth Science in a Global Context	3
	ASTR 4000 Astronomy for Teachers	2
	NASC 5300 Natural Science Assessment	2
	NASC 5400 Spatial Data and Instructional Technology	1
Summer 2	NASC 5130 Life Science in Global Context	3
	ENTO 5601 Insects for Teachers	1
	SOC 4890 Global Populations & Environments	1
	NASC 5320 Science, Technology and Society & Plan B Research	2
	BOT 4790 Field Techniques	1

Summer 3

NASC 5110 Physical Science in Global Context	3
NASC 5600 Math & Stats in Science Teaching	2
NASC 5510 Integrated Instructional Strategies	2
EE 4800 Energy Policies and Impacts	1
+ 6 additional credits for a total of 30 + a Plan B non-	
Middle Level Mathematics (MMA)	
MATH 5160* Social and Historical Issues	3
NASC 5205* Methods for Teaching Middle Level Math	3
NASC 5170 Connecting Geometry	3
NASC 5225 Assessment for Middle-level Math	3
MATH 5190* Mathematics of Change	3
MATH 5140* Numbers and Operations	3
NASC 5215 Technology	3
NASC 5185 Analysis of Data	3
+ 6 additional credits for a total of 30 + a Plan B non-thesis	
Natural Science Education (NED)	
ZOO 5430** Ecology of Yellowstone Ecosystem	3
ZOO 5420** Ecological Inquiry	3
NASC 5610** Field Studies: Environmental Education	4
NASC 5620** Field Ecology	5
NASC 5650 Place-based Learning	3
Graduate level Research Class	3
+ 9 additional credits for a total of 30 + a Plan B non-thesis	

- b. Distance delivery of programs/major
 - i. The MMA program is designed to serve the work schedule of teachers and enable them to complete the course work in two years. Six credits are offered in Laramie for 3 weeks in June each summer and a 3-credit synchronous course is offered online each fall and spring usually on Tuesday evenings.
 - ii. The MSC program requires more hands-on experiences and coursework is designed to be completed in three summers (4 weeks, on campus in June). Electives may be taken online.
 - iii. The NED program is offered in conjunction with the Teton Science Schools in Jackson. Students are admitted as UW students, take classes and work in field science education in the graduate program in year 1 in Jackson (classes are taught through the Outreach School by adjunct faculty and transcript credits issued by UW). Those students who choose

(and meet requirements) may come to UW on campus for the second year of the program to complete their master's degree.

Most students complete their coursework, electives and Plan B projects within the established cohort program, but some find it challenging to finish their Plan B when they are working fulltime. The SMTC Outreach Educator created a 4-credit course offered each fall to provide the structure and skills to SMTC graduate students to design and complete their Plan B projects. It is an online synchronous course through Outreach although some participants who live in the area choose to attend in person. Two intensive weekends conducted face-to-face enable students to form a professional learning community in which they plan, share, provide feedback and mentor each other establishing relationships across the state and across programs.

Completion rates have increased dramatically since this course was implemented.

Describe the role of the program within the context of the college and the mission of the University:

In addition to serving STEM teachers by offering master's degree programs designed to fit their work schedules, SMTC engages in outreach efforts by providing professional development to Wyoming primarily through grant-funded outreach in collaboration with UW faculty. SMTC also puts on the Wyoming State Science Fair which brings more than 300 students and many teachers to campus each March. The event links teachers and students from throughout the West -- UW faculty too!

The SMTC plays a distinct role at UW as a long-term unit committed to interdisciplinary collaborations that support the teaching and learning of science and mathematics, and more recently engineering, technology and the arts. Supported by both the Colleges of Education and Arts and Science, the SMTC plays a leadership role in providing high quality, timely professional development that is research-based and culturally relevant to teachers in Wyoming and across the western United States. That means that the SMTC does not engage in one-shot workshops but works to provide professional development and ongoing follow up support increasing the likelihood of successful implementation. SMTC is both a resource center for educators and a center for developing projects and grant proposals to fund collaborations between K-12 schools, the Wyoming Department of Education, community colleges and University of Wyoming faculty. The SMTC offers master's degree programs to experienced teachers; facilitates collaborations on campus and around the state with organizations such as the WY After School Alliance, the Wyoming Environmental Education Association, and the Teton Science Schools. The SMTC is a national leader in place-based education, culturally relevant pedagogy, and increasing diversity in mathematics education.

The SMTC jointly sponsors and/or participate in planning and conducting events such as the SciArt Symposium this week with the Art Museum, Biodiversity Institute, the Haub School, and the Visual Arts Department; the Saturday STEM Days and Women in Science with WY STEM and the NASA Space grant. It sponsors speakers and invite the

entire campus and local educators (a good example is Chris Emden, a well-known science educator at Columbia University who uses hip hop to get kids to love science). The faculty sits on boards and committees such as the NASA Space Grant Advisory Board, the Biodiversity Institute's Faculty Advisory Committee, the Committee on Women and People of Color, the Haub School's Innovation Grants selection committee. It is actively involved with WY STEM, the Engineering Initiative and SER.

Financial data relevant to the academic program:

Ratio of student credit hours per FTE

The total program FTE is based on the assigned teaching load for the 3 SMTC faculty (Leonard: 25%; Houseal: 40%; and Parker: 30%).

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	Total
Grad	589	844	713	877	698	751	4472
PD 5959 ^b	553	495	429	311	360	433	2581
Total	1142	1339	1142	1188	1058	1184	7053
FTE	.95	.95	.95	.95	.95	.95	
Credit Hrs/FTE	1202	1409	1202	1114	1114	1246	Average 1214.5

Direct instructional expenditures:

- i. The state support budget does not include faculty pay; expenditures are not tracked to specific programs or individuals. SMTC faculty typically teach NASC courses on- load and receive no extra pay. Faculty from other departments who teach courses for SMTC students particularly during the summer are paid as instructors. This table shows the income as well as summer school and course fee inputs.

Year	State support budget*	Summer School & Course Fees	Summer Salaries Faculty Teaching
2010	\$11,403	\$29,472	\$21,224
2011	\$10,833	30,530	12,611
2012	\$11,403	25,594	14,123
2013	\$15,000	No distribution	17,639
2014	\$15,168	29,818	9,750
2015	\$14,423	14,149	11,100

*Does not include \$75,000 provided for WSSF Coordinator and fair or for faculty and support staff

Course enrollment

- i. Because the MMA and MSC programs each include 24 credits of mandatory courses that are offered on a rotating basis, it is our

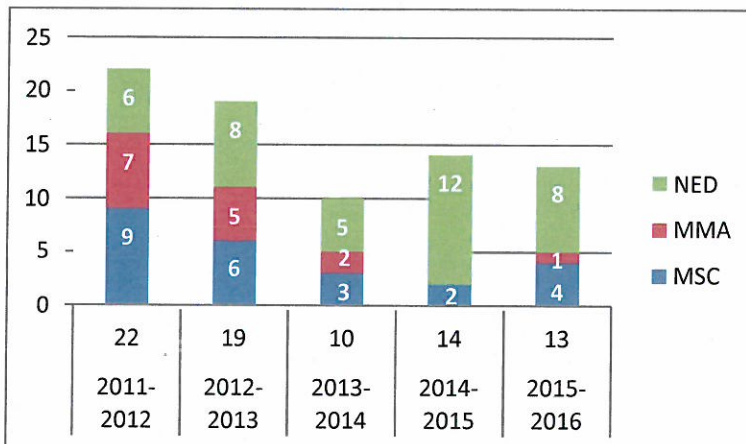
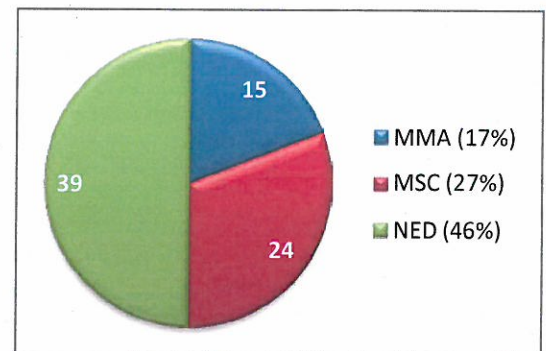
responsibility to offer the courses even if there is low enrollment so students don't have to wait 2 or 3 years until those particular classes are offered again. The only courses that appear to be under-enrolled are NASC 5959 professional development workshops – some participants might sign up for PTSB credit or none at all. All classes required for the degrees appear to have adequate enrollment numbers.

Admission, enrollment and graduation data relevant to the program, including the number of students currently enrolled and the status of their progress toward graduation:

Program Productivity/Demand:

- a. 78 graduates over 5-year period³ (2011-2016):
- Middle-level Science Teaching (24)
 - Middle-level Mathematics Teaching (15)
 - Natural Science Education (39)

This chart represents the percentage of graduates from each program out of our total of 78 graduates. 46% (n=39) were from the NED program with Teton Science Schools, indicating this partnership has yielded excellent results.



This graph on the left shows the number of students who graduated from the three SMTC graduate programs each year over the past 5 years. On average, 16 students were graduated per year over this time period.

- b. Enrollment in MS in Natural Science concentrations over the 5-year period averaged:
- Middle level Science Teaching (14/yr)
 - Middle level Mathematics Teaching (11/yr)
 - Natural Science Education (9/yr)

An informal survey of graduates of the NED program showed that all but 4 of the 39 graduates are gainfully employed in areas related to their degree. All of the students in the MSC and MMA programs are employed teachers so few of them change jobs although some take on leadership roles within their districts.

Describe the administration of the program:

Functioning as a hybrid department within and across the College of Education and the College of Arts and Sciences, the SMTC facilitates collaborative interdisciplinary professional development projects that support teachers in Wyoming and across the western cultural and geographic region of the United States of America.

The Director position is vacant.

Describe the faculty and academic professionals who serve in the program, including their academic credentials, academic rank and length of service to the University:

Faculty. The SMTC has only two tenured or tenure track faculty and one Senior APL (extended term). The coordinator of the Wyoming State Science Fair (WSSF) is in a Temporary Assistant Lecturer position.

- Ana Houseal, PhD, Secondary & Continuing Education – Science Education, Assistant Professor, Appointed 2004
 - Sylvia Parker, MA, Technology in Education, Senior Academic Professional Lecturer, Appointed 2004
 - Erin Stoesz, MS, Geology and Celtic Studies, Coordinator of Wyoming State Science Fair, Appointed 2015
- i. 93 Affiliate Faculty members in the Colleges of Agriculture (5), A&S (37), Education (21), Engineering (5), Other UW (7), Community Colleges (3), and Emeritus (15). Affiliates assist with reviewing applications, teaching classes, mentoring students, serving on graduate committees, collaborating on grant-funded projects and providing professional development to teachers.
- ii. Grants awarded to academic personnel and/or managed by SMTC since 2010
- External grant funding: \$9,863,020
 - Internal UW awards: \$69,792
 - Contracts/Service Agreements: \$434,972
- iii. Publications/presentations by academic personnel 2011-2016
- Jacqueline Leonard, Professor: 13 Journals, 1 article, 5 chapters, 1 book;

- 36 presentations, 3 proceedings
- Ana Houseal, Assistant Professor: 5 Journals, 2 articles, 3 reports, 2 curricula; 32 presentations
- Sylvia Parker, Senior APL (extended term), 3 papers, 25 presentations

Describe the program facilities, including classrooms and offices, library and equipment used by or dedicated to the program:

SMTC program facilities include seven offices (WH 449, 453, 455, 457, 459, 454, 450), which are (were) occupied by three faculty members (including the director), office associate, accounting associate, Wyoming State Science Fair Coordinator, and work study student. Facilities also include a storage closet for materials and supplies, conference room (WH 445), copy and mailroom, kitchen, meeting space (WH 402) and classroom that is shared with ROTC. Equipment includes the use of a Promethean board in WH 445, computers, laptops, and LCD projectors (see attached file from our last audit).

Evaluations from accrediting bodies or other reviewers of the quality of the program and its faculty and academic professionals:

The SMTC programs are not ranked. Information about their reputation is largely anecdotal. Many teacher leaders in the state are graduates; graduates refer their friends and colleagues. Those who are in the program are fiercely loyal.

- i. The MMA and MSC programs prepared for the National Council for Accreditation of Teacher Education (NCATE) accreditation review that was conducted in the College of Education in 2015. However, that cycle of reviews was focused on undergraduate programs rather than graduate programs. The two SMTC programs were referred back for evaluation to the Wyoming Professional Teaching Standards Board (PTSB), the organization that had previously evaluated both programs and recognized them. The PTSB uses nearly identical criteria as NCATE. Paperwork was revised and submitted and the MMA was accredited during AY 2015-16; the MSC program has been submitted for accreditation this year (FA16).
- ii. There is no specific accreditation for the NED program through NCATE.

Comparison of the program with related or similar programs:

The SMTC programs are unique at UW. The synergy between the academic programs, the outreach efforts, relationships with faculty and other UW interdisciplinary programs, and institutional support should not be underestimated.

Describe the anticipated effects of elimination of the program upon the college in which the program is situated, upon other colleges and units of the University, and upon the University as a whole, including:

Effects upon students enrolled in the academic program:

Minimal. The degree programs currently housed in the SMTC will be maintained by moving them to the most appropriately aligned university departments for future administration if the SMTC as an administrative unit is eliminated.

The College of Education will work with the College of Arts and Sciences to determine the appropriate locations for graduate degree programs currently housed in the SMTC in order to facilitate the degree progress of those students in these graduate degree programs.

Effects upon faculty and academic professionals who serve in the program, including termination of any existing positions:

Dr. Jackie Leonard, Former Director, has resigned as Director and returned to her tenured Full Professor line in the Department of Elementary and Early Childhood Education, Appointed 2012.

The following could lose their employment with the closure of the SMTC:

Ms. Sylvia Parker, Coordinator, Appointed 2004

Erin Stoesz, Wyoming State Science Fair Coordinator, Appointed 2015

Lindsey Galey, Office Associate, Appointed 2013

See implementation section below for the process if termination does occur.

Educational and financial effects upon other units of the University:

The Provost's office will examine the best organizational structure to support a coherent, cohesive university- and statewide support mechanism for recruiting and retaining STEM majors to UW, and to support the Science, Engineering, and Education Initiatives simultaneously. This will require a re-envisioned P-16 STEM support structure, but should have minimal financial or education effects. In fact, it will likely enhance both.

Effects upon faculty, academic professionals, staff, students and alumni of the University:

The efforts outlined above will provide enhanced benefits to all stakeholders.

Effects on the State of Wyoming, including loss of benefits conferred outside the University by the academic program:

The efforts outlined above will provide enhanced benefits to all stakeholders.

Implementation plan to be followed in the event the academic program is eliminated, including:

Procedures for handling current and future applications for admission:

Expected timeline to meet teach-out requirements established through the regional accrediting body.

The degree programs currently housed in the SMTC will be maintained by moving them to the most appropriately aligned university departments for future administration if the SMTC as an administrative unit is eliminated.

The College of Education will work with the College of Arts and Sciences to determine the appropriate locations for graduate degree programs currently housed in the SMTC in order to facilitate the degree progress of those students in these graduate degree programs.

Plans for assisting currently enrolled students to complete the course of study:

As above.

Plans for accommodating faculty and academic professionals who will be terminated or otherwise affected by elimination of the academic program:

Per UW Regulation 6-43, the University shall offer the tenured faculty member or extended term academic professional another appropriate position in the University if the person is qualified and the position is available before the date of the termination of the person's position. In the allocation of appropriate positions, positions shall first be offered to tenured faculty and extended term academic professionals who are being terminated before offers are made to probationary faculty and academic professionals or other persons not currently employed by the University.

If no appropriate University position is available for which the person is qualified, the University shall continue the position of the tenured faculty member or extended term academic professional for at least the next full academic year after the date of the termination of the person's position. The continued position may be assigned appropriate duties consistent with the best interests of the University.

The University shall offer the probationary faculty member or probationary academic professional another appropriate position in the University if the person is qualified and the position is available before the date of the termination of the person's position. In the allocation of appropriate positions in the University positions shall first be offered to probationary faculty and probationary academic professionals before offers are made to persons not currently employed by the University.

If no appropriate University position is available for which the person is qualified, the University shall continue the position of the probationary faculty member or probationary academic professional who is in at least the third year of service on the date of the termination of the person's position for at least the next full academic year after that date. However, for a probationary faculty member or probationary academic professional in the second year of service, the position shall be continued for at least six months. For a probationary faculty member or probationary academic professional in the first year of service, the position shall be continued for at least six months. The continued position may be assigned appropriate duties consistent with the best interests of the University.

A faculty member or academic professional who receives notice of termination because of elimination of an academic program shall have the right to appeal the termination under UW Regulation 5-35, Appendix B, but not the decision to eliminate the program, unless the decision is based in whole or in part on financial exigency under UW Regulation 6-41.

The Provost's Office will begin immediate exploration of how the work of the three current university initiatives, science, engineering and education, could be combined to support a University STEM P-16 Education Center to support seeking and obtaining broader impact grants and contracts in STEM disciplines and in the P-16 educational community.

The Wyoming State Science Fair coordinator and associated state funding should be shifted to a different organizational structure, which could be housed on the UW campus. The Provost's Office is charged with investigating optimal structure. This will likely move to the WYSTEM or re-envisioned STEM P-16 Education Center, or other affiliated entity at UW.



College of Education

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December 22, 2016

MEMORANDUM

TO: Kate Miller, Provost/VPAA

FROM: D. Ray Reutzel, Dean

RE: Program Review for the Science Math Teaching Center: Dean's Response, 1st comment period

Solicitation of Input

We sought input from students, faculty, staff, and external audiences in the P-12 community. Our first effort was for the Dean to present the recommendation to eliminate the Science Math Teaching Center (SMTC) to the membership of the *Wyoming Professional Teaching Standards Board* (PTSB) on October 10, 2016. In addition to this group, the Dean presented this information to the *Wyoming School-University Partnership* members in Casper on November 3, 2016. These organizations were judged to be key to approval of and input about our educator preparation programs. The Dean also provided a written explanation of this recommendation to the *Wyoming School Boards Association*, which was read aloud at the most recent meeting of the Delegates Assembly by local School Board Chair, Janice Marshall (Email dated 11.7.16).

We also established a Dean's Office email address to receive input from any interested individual or group internal or external to the College or University. This email address was distributed through the Office of Teacher Education to the student body and to our faculty through an email announcement from the Dean's Office in October 2016

As Dean I have not met personally with the affected program students as current degree programs housed in the SMTC will continue but need to be given permanent academic homes in academic departments within the Colleges of Arts and Sciences and Education. As Deans, we have met in person with the affected faculty and staff members, Jackie Leonard, Sylvia Parker, Erin Stoesz and Lindsay Galey, as well as with one another as deans to discuss this recommendation. In addition, we advertised to faculty, staff, and students open town hall meetings held in the College of Education in regard to this program on November 2, 2016 to receive additional input.

Summarization of Input

At the Dean's Presentation to the *Wyoming PTSB*, Superintendent John Lyttle of Laramie County School District #1 vigorously resisted the elimination of the SMTC citing his

district's need for professional development to serve science and math educators. Similarly school superintendents at the *Wyoming School-University Partnership* meeting in Casper were less vigorous but questions were asked and explanations given. The Dean has not heard any further comments from the superintendents in attendance. The *Wyoming School Boards Association* had planned to pass a resolution against this program elimination but after hearing the Dean's explanation read aloud at the Delegate's Assembly determined not to do so.

There were 0 responses expressing concern about the recommendation to eliminate the SMTC sent to the Dean's Office Email Address. The Dean received via email four responses from concerned teachers, Science Fair Coordinator, former faculty and directors of the SMTC, and other public parties. These were sent to the Provost's website after the 1st Comment Period closed on December 16th, 2016.

The Deans have also received input from the SMTC Transition Management Team during the fall related to the future of the SMTC. Dean Reutzel has also had multiple conversations with former SMTC Director and Dean of the College of Education, Dr. Patricia McClurg, about the recommendation to eliminate the SMTC and in its place roll out a new university P-16 STEM Education Center.

Response to Input

The SMTC at UW is dependent upon a core of strong leadership that promotes collaboration between and among internal office staff and among a group of affiliate faculty members from the Colleges of Arts and Sciences and Education. The program has graduated 78 master's degree students in the past 5 years in three graduate degree programs: Middle level science, Middle level math and Natural science education. Graduates acquire a wealth of knowledge and competencies in this program that are transferrable not only to classroom teaching but also to leadership roles in math and science education within Wyoming, regionally, and nationally. These same graduates can, upon appropriate application, receive professional licensure endorsements through the *Wyoming Professional Teaching Standards Board* (PTSB) for mathematics and science education. Consequently, the degree programs housed in the SMTC are valuable assets to the Colleges of Arts and Sciences and Education and will be maintained but housed within appropriate academic units to be determined in the future.

The SMTC also has an endowment of 1.3 million dollars and has generated over 10 million in external funding in the past six years. Consequently, using these indicators one would be convinced that the only rational recommendation would be to continue the SMTC and its programs well into the future.

The problems, however, with the SMTC aren't to be found in these surface level productivity statistics. Instead, the problems with the SMTC are composed of an inter-related set of internal issues that have led us to reconsider, even re-conceptualize, the potential of the SMTC if it were to be shuttered, reconfigured with a new and broader university role in STEM education, and integrated with three of the university's current initiatives, Science, Engineering, and Education. We cite three reasons why the SMTC as

it now stands should be eliminated and slated for updating, re-visioning, and re-establishment as a university-wide P-16 STEM EDUCATION Center at UW.

The first reason for closing the SMTC is linked to highly dysfunctional relationships among personnel in and affiliated with the SMTC. The once vibrant relationships between the two colleges have all but evaporated. The SMTC has played little or no role in the university's Science Initiative. Negative relationships between the past leadership, staff, and affiliate faculty have necessitated multiple interventions from outside consultants, university administrators, and faculty conciliators to ameliorate the destructive and unhealthy human relationships manifested over time in this organization.

Second, there has been a decreasing number of affiliate faculty members who choose to run their grant applications or currently funded projects through the auspices of the SMTC. This substantiates the erosion of confidence and participation in the SMTC. Not only has the SMTC become known for its lack of capacity and basic expertise in grant administration, but also for its high turnover in SMTC staff, which has only exacerbated the SMTC's already sagging reputation.

Third, SMTC's mission lacks alignment with more current conceptualizations of science and mathematics education within the broader field of STEM or STEAM disciplines on and beyond the university campus. THE SMTC has failed to provide the necessary intellectual leadership across the university to modernize its mission and connect the disparate bits and pieces of faculty and staff interests in STEM disciplines into a broader university-based STEM focus. Furthermore, having failed to connect to the larger focus of STEM and provide university leadership in STEM related interests on the campus, both the SMTC and the university have failed to build a coherent STEM organization on the campus that is prepared with the capacity to compete for large NSF, Department of Education, NIH, and other broader impact grants. This limits the amount of potential external funding available for research in STEM disciplines and in STEM education on the UW campus.

We believe that the original intent of the SMTC was to be a grant supported entity on the UW campus and not a state funded entity. Over time, financial support evolved to include a small amount of state funding to continue SMTC's functions in lean times and then expanded when additional duties were added. The Wyoming State Science Fair has become entangled with the SMTC for example. This is a major state-funded element for the SMTC and the event is immensely popular in Wyoming. We, however, ask why this state function is not found more reasonably within the purview of the Wyoming Department of Education (WDE) rather than in the SMTC at the University of Wyoming.

Since this is primarily a P-12 endeavor, its placement in a university research, development, and service center is at the very least debatable. Although we vigorously support the need for a statewide science fair, we raise the question as to the rationale for the locus of control for this state function to be at UW rather than at the WDE.

The organization of the three master's degree programs into the SMTC is a somewhat aberrant organizational practice since degree programs are typically housed in academic

units such as departments and colleges and not in centers, institutes or other academic units. The current masters degree programs offered in the SMTC, although productive, can be given departmental academic homes within current or even revised university college and departmental structures. As a result, the argument that the SMTC needs to continue in its current form to support existing graduate degree programs is also questionable.

Finally, with the resignation of past director, Dr. Jackie Leonard, and her subsequent retreat to her tenured faculty line in Elementary and Early Childhood Education, there is no faculty line into which we could recruit a new director since the current budget crisis has resulted in freezing all faculty lines and yielding some of these permanently to the University's budget cuts. Consequently, in this environment, it is highly unlikely that we would get a faculty line to replace the director of the SMTC. The SMTC transition management team cannot indefinitely serve to direct the affairs of this once viable unit on campus.

Taken together, these subtle but important internal factors we have noted here, which are unrelated to the surface level statistics of program productivity, argue that the SMTC is in need of major transformation if not a complete overhaul of mission, personnel, physical location, etc. This realization is not to impugn the many past achievements of the SMTC leadership, faculty or staff—quite the contrary. **We believe the spirit and past functions of the SMTC should be retained, enhanced, and coalesced into a cogently designed university center or institute focused on P-16 STEM Education.** Consequently, we support immediate exploration by the Provost's Office into how the work of the three current university initiatives, Science, Engineering and Education, could be combined with the past work of the SMTC and its supporters, as well as other groups such as WYSTEM, to support a **University P-16 STEM Education Center**. This would allow UW to seek and obtain broader impact grants and contracts in STEM disciplines and to support improved STEM instruction within the P-16 educational community.

Deans' Recommendation at Conclusion of 1st Comment Period

It remains the recommendation of the Deans that the SMTC be discontinued. As described above, the Deans of Arts and Sciences and Education have been in discussion about proposing, when economic conditions warrant, a university wide P-16 STEM Education Center at UW to the University's Provost.

Sincerely,



Paula M. Lutz, Ph.D.
Dean



D. Ray Reutzel, Ph.D.
Dean

December 16, 2016

To: Dr. Laura Nichols, President
Dr. Kate Miller, Provost

From: Patricia McClurg, Retired Dean, College of Education

Re: Science and Mathematics Teaching Center (SMTC) Review

The purpose of this memo is to provide additional input into the possible reconfiguration of the SMTC. I have been formally involved with the SMTC in various capacities since 1984. I have included examples below to illustrate experiences that inform my perspectives.

- Affiliate Faculty Member 1985-2001
- Director of SMTC (then called the Natural Science Program) from 1996-2001.
- Dean, College of Education collaborating with Dr. Walter, College of Arts and Sciences to oversee the SMTC - Dr. Judith Ellsworth and Dr. Robert Mayes served as SMTC directors during this time frame.
- PI of 2 major NSF grants: Both involved extensive collaboration among UW Arts & Education faculty in the areas of mathematics, sciences, and mathematics and science education:
 - *Improving Middle-Level Mathematics Teaching and Learning: A Statewide Initiative* (Developed Middle Level Mathematics Masters Degree Program) 2001-2004; \$1,116,973.
 - *An Experimental Teacher Education Program in Elementary Science* (Developed required science content and seminars for undergraduate students) 1988-1992; \$1,366,616.
- Co-PI on 2 major NASA funded grants:
 - *A Public Access Resource Center (PARC) Empowering the General Public to Use EOSDIS* (A 5-State collaborative initiative housed at the University of North Dakota. I served as the Co-PI from Wyoming, involved UW Arts & Sciences and Education faculty members and directed the EDPARC activities aimed primarily for K-12 teachers in the five states) 1996 – 2002; \$7,920,000.
 - *Development of a Planetary and Space Science Center at the University of Wyoming* 1992-1997; \$644,256
- PI-or CO-PI on many Eisenhower grants and EpSCOR subcontracts \$594,000.

My recent reading of both the “Academic Program and Unit Review” and the “Dean’s Program Review Memorandum” of September 13, 2016 has left me proud, excited and anxious.....

PROUD

The Academic Program and Unit Review document summarized and detailed the **remarkable** productivity of the center over the last five years. Clearly the SMTC has continued to have a major influence in STEM education in the state and region through degree programs, professional development for K-12 educators and grant-funded initiatives. It is impressive to see the results of current faculty members’ work to update, expand, improve and deliver such a large array of experiences addressing national and state goals for quality STEM education.

I am pleased that the revised delivery structure has been able to provide these experiences with only two and one half faculty positions. (The iterative revision was necessitated by a combination of reduction in faculty lines and changing program requirements for certification of K-12 teachers. The current structure is similar to the then emerging ENR program. University faculty members in relevant departments choose to become affiliate faculty members who may teach (often in summer), advise students, serve on graduate committees, deliver workshops and/or serve as resources for K-12 teachers.)

Comments in the Dean's Program Review Memorandum acknowledging the history of contributions of many faculty members and administrators are equally gratifying:

"The Science Math Teaching Center (SMTC) housed on the UW Laramie campus has had a long and distinguished history of collaboration between two colleges, research and grant productivity, statewide service and engagement, graduate degree production, and leadership in policy and practice in math and science education nationally. . . . For nearly fifty years, the SMTC has been nurtured by scores of visionary academics, who labored to bring into existence a center where the content fields of math and the life, earth, and physical sciences could engage productively with math and science educators to meet the needs of P-16 mathematics and science educators in the state of Wyoming and beyond."

EXCITED

Through most of the long history of SMTC faculty members from the Colleges of Engineering and Agriculture have been involved in planning and delivering SMTC grant initiatives, teaching NASC courses and serving on graduate committees. More recently, increased collaboration between the SMTC and ENR and personnel in the School of Energy Resources has occurred. Having a recognized organizational structure that includes these important players has been a goal of several past SMTC directors. The recommendations included in the Dean's Program Review Memorandum to expand the formal involvement of other colleges and units into a restructured STEM center could provide many opportunities.

An expanded STEM center organizational structure could:

- Nurture synergy and creativity among the large number of UW STEM initiatives and STEM faculty members.
- Maximize university resources and ability to provide for a coordinated UW presence distributed among more Wyoming communities and school districts.
- Strengthen and increase success in obtaining extramural funding. (It is clear from reviewers and program officers' comments that the SMTC's intercollegiate / interdepartmental organization has been a significant factor in obtaining major national grants.)

ANXIOUS

K-12 teachers and school districts are critical to the success of a P-16 or P-20 STEM center at UW.

A large and loyal cadre of K-12 teachers have accompanied and contributed to the successes and evolution of the SMTC through its 50 years of existence. Current mandated state budget cuts are affecting all levels of state supported public education. Wyoming teachers are well aware that multiple programs at all levels are under

review and may even face elimination. Whether the decision is to restructure the SMTC as a STEM center; replace the SMTC with a STEM center or to eliminate the SMTC - **I believe it is critical that we find ways to assure our K-12 teachers that statewide K-20 STEM education is a high priority for UW - as it is for Wyoming and its future and for our nation and its future.** I assume that the transition committee now charged with overseeing the operation of the SMTC will continue until the STEM center is operational. As soon as possible teachers need to know which degree programs and opportunities for professional development will still be available.

Feedback from graduates of the SMTC degree programs place a high value on the quality of the programs, the opportunity to work with UW faculty in their content fields as well as UW faculty with expertise in effective teaching and assessment strategies. Many comment directly or indirectly that they enjoy the status they derive from completing these degrees. The middle-school master's degree option offers a rare opportunity for elementary/middle-school teachers to acquire a program specifically designed to provide graduate level course work that covers both the broad – content STEM knowledge they are required to teach as well as effective teaching and assessment practices.

The close relationships developed with many of the teachers who have graduated from the SMTC's graduate programs and professional development activities benefit the university. Maintaining these close relationships in any new structure should be a high priority.

Student Recruitment. These teachers:

- Discuss and provide advice to their 6-12 grade students and their parents regarding merits of UW and its program offering and encourage (or discourage) their attendance.
- Influence other teachers in their district and in their professional organizations at the state, regional, and national level regarding the quality of UW offerings.
- Recommend professional development coursework to their colleagues and district administrators.

External Funding from agencies such as NSF, NASA or Department of Education

These teachers:

- Assist in locating sites where UW faculty can respond to RFP requirements when it is essential to involve K-12 students as subjects in the research project.
- Help in securing school district-level participation with the university to fulfill the outreach and dissemination requirements.
- Serve as a Co-PI or participant in research initiatives.

Serve in Influential Positions:

- Most of the teachers who complete SMTC graduate programs are recognized as outstanding teachers who receive local, state, or national recognition. As a consequence they are often consulted by their local and state legislators who are determining direction for education policies and budgets.
- Upon completing their masters degrees, some graduates assume district-level science curriculum specialist positions, and/or district level professional development coordinators. Either of these positions often involve setting direction for their own district, selecting institutions of higher education to provide district wide professional development and influencing directors in other districts.
- Several of these teachers serve on policy making boards at both the local and state level. Some are invited to serve as reviewers for state and national grants in STEM areas. A few run for political offices.

In summary, I encourage the establishment of a STEM Center either through restructuring or replacing the SMTC – a center which will evolve, coordinate and expand UW's STEM education and include carrying on the SMTC's focus reflected in fifty years of quality work with STEM K-12 teachers in the state.

Thank you for the opportunity to share my prospective with you.

Respectfully submitted,

Patricia McClurg

Anne M. Alexander

From: Sylvia D. Parker
Sent: Friday, December 16, 2016 7:38 PM
To: Program Review - Academic Affairs Office
Subject: Proposal to eliminate the Science and Mathematics Teaching Center

As the Coordinator in the Science and Mathematics Teaching Center (SMTC) since 2004 with a vested interest in its future, I offer the following with regard to the Deans' Proposal to Eliminate the SMTC.

While it is surely the prerogative of the administration to review and reorganize the structure of the university and to make significant changes, I encourage you to consider the following in your deliberations:

1. The SMTC has a **solid reputation** in the state and region based on its 46 year history. We know this state and are well known.
2. SMTC is fulfilling with flying colors one of the **functions of a land grant university** (serving the people of the state): we engage with educators, community members and organizations in almost every county in the state through our professional development (PD) and graduate programs and much of that is based on current research activities.
3. Because the PD and graduate programs are **content-rich**, we work closely with UW faculty and community college faculty in content areas to plan and coordinate classes and professional development for hundreds of teachers in the region which means that we know how to co-teach and design interdisciplinary courses, how to incorporate best practices in instruction and assessment, and how to evaluate and improve those programs.
4. We have **assisted faculty** by helping researchers think about "**broader impacts**" for their grants; identifying, contacting and recruiting K-12, community college, community and university partners; developing and teaching or co-teaching workshops; collaborating on grant proposals; handling submissions, paperwork and reports; providing accounting support; publicizing their projects, events and courses, and connecting with graduate student assistants. In recent years we have not managed as many grants because of high turnover in our accounting position and the inability to provide reliable and timely financial information.
5. The SMTC has been involved in **STEM** for many years offering professional development in various areas including engineering for science and math teachers, use of gaming to engage underserved students, and application of quantitative reasoning to solve grand challenges. And we've strategically gone after and gotten grant funding in collaboration with faculty throughout this university and others to do those things. We have actively attended, participated in, assisted with, presented at, and co-sponsored numerous STEM and STEAM workshops, conferences and events on campus and around the region. We too would like to see "a coherent STEM organization on the campus" and have voluntarily participated with others to bring more coherence to the work because we saw the need.
6. **Graduate students** in SMTC programs make important contributions on campus helping to develop curriculum and assessments for the Biodiversity Institute and the School of Energy Resources, for example, and piloting them in the classrooms of teachers in our other graduate programs. They base the work on the research they're doing for their Plan B projects, and disseminate it through published papers, conference presentations and professional development for teachers thus impacting a large audience. Through all of this they are mentored by faculty and gain access to professional communities through them.

The **synergy** between the various aspects of the SMTC should not be underestimated. From the endowments that provide scholarships for teachers, to the interdisciplinary nature of the degree programs that requires collaboration, to the relationships and experience from years of actively working throughout the state, to the expertise on things like the Next Generation Science Standards, to the ability to write, obtain and manage grants, provide cutting edge professional development and do research – these things are greater than the sum of the parts and will be significantly weakened or disappear if the SMTC is eliminated and the degree programs (which are actually only half of what the SMTC does) are simply relocated.

UW definitely needs greater coherence and coordination when it comes to STEM activities and engagement on campus. I believe that direction needs to come from a strong commitment from the top that includes leadership and resources. The SMTC is doing many things well and could provide a foundation on which to build or from which to learn. I suggest that the SMTC be maintained for a year or two until a STEM Center with a clear purpose, staffing and mandate can be established and then those parts of the SMTC function that seem appropriate and useful can be incorporated or redistributed within the university.

Thank you for considering this input and all of the others you've received. This is no small task; there are no easy answers; I appreciate the role you must play as Solomon.

Respectfully,

Sylvia D. Parker, Coordinator, SMTC, sparker@uwyo.edu, 307-766-6671

PS. Two points of clarification to the Deans' proposal: the Wyoming State Science Fair did not "become entangled with the SMTC" – even though we did not see working with students doing science fair projects as part of our mission, we saw coordinating the state fair competition as a good mechanism to support teachers and provide them with professional development in order to help them engage more diverse students in science and increase the quality and depth of science instruction. We also saw the fair as a way to connect STEM faculty with teachers and students and contribute to the recruitment of future UW students. We did that when no one else would take on the responsibility of the fair just as no one else wants to do so now.

Finally, the Enzi STEM building is a classroom building designed for undergraduate courses. There are no faculty/staff offices in the building – it wasn't built for that purpose. A classroom would have to be transformed into a P-16 STEM Education Center. The SMTC was offered a small office in the building during the design process but it didn't make any sense to have one person housed there (and everyone else someplace else) since we weren't involved in undergraduate education and there would be no one else from any department in the building with whom to collaborate.

In response to the proposal to eliminate the Science-Math Teaching Center (SMTC), I would like to offer the following. My sense is that the elimination of this unit is insufficiently justified at this time, based on the information provided in the proposal. The basis for my contention that this proposal is unfounded rests on five considerations.

1. The proposal (and other information that I've gleaned from faculty associated with the SMTC) indicates a recent decline in the viability of the Center. As far as I can tell, this is largely a function of ineffective, perhaps even inept, administration. The decision to eliminate a program based on the performance of a director over a limited period of time—a director who is no longer in that role—seems to be a very poorly justified action. There is a tendency at UW (and other universities) to make important decisions based on personalities, rather than sound, conceptual and structural reasoning. This would appear to be such a case.
2. The proposal to eliminate the SMTC critically hinges on the promise of a new P-16 STEM Education Center. Such an initiative would be potentially quite valuable. However, there is absolutely no description of how this new Center would function, how it would be funded, how it would be staffed, what its mission would be, etc. Phrases such as “potentially housed” makes it clear that there is no substantive plan—only a vague notion. Academic Affairs recognizes the importance of a science literacy initiative, but given the current fiscal climate, one must be extremely skeptical that UW has the funds to create an entirely new Center. Claims that, “The Provost’s office will examine the best organizational structure...” and “The Provost’s Office is charged [by who?] with investigating optimal structures...” are not terribly promising given that Academic Affairs has exhibited very little sense of urgency regarding serious matters (e.g., making decisions regarding faculty hires). As such, one must be very dubious that the conceptualization, development, and implementation of a new Center will happen with any speed (despite claims that “The Provost’s Office will begin immediate exploration...” which is, itself, a very weak assertion as “exploration” is practically meaningless). It seems likely that UW will be left without any such venture for an indeterminate and extended period of time should the SMTC be eliminated. In short, there seems to be abundant evidence that the SMTC was flourishing until recent times (again, due to an ineffective administration)—and without a clear plan for a new venture, it seems entirely premature to eliminate the SMTC.
3. The evidence presented in the proposal makes clear that even in the period during which the SMTC has been in supposed decline, the unit has been remarkably productive. They are generating 15 Masters-level graduates and \$1.5 million per year, which are very impressive figures. Moreover, the generation of 1214 credit hours/FTE seems rather extraordinary. In addition, 90% of graduates are employed in the area of their degree. And all of this comes at a cost of a measly \$14,000/year in state support. The return on investment appears to be tremendous, leading one to wonder why such a venture would be considered for elimination. The verbiage that attempts to justify elimination fails to provide a compelling argument given the quantitative data. It does seem that the SMTC warrants greater resources, but this is a very different prospect than elimination with the vague promise of something newer and better. What seems to make sense is to hire an effective director for the Center.
4. Even without functional leadership, the SMTC faculty/staff appear to be capable of recognizing and solving important problems. For example the new 4-credit course dramatically increased completion rates of graduate students. This sort of initiative suggests that with competent leadership (and enhanced support rather than elimination), the SMTC could flourish.

5. The assertions that there will be “enhanced benefits to all stakeholders” are frankly unbelievable. The claims make reference to the “efforts outlined above” which cannot be found. What efforts? The vague assurances that the Provost will explore and investigate possibilities are entirely insufficient. When/if Academic Affairs presents an explicit and coherent plan for what will replace the SMTC, then—and only then—can the elimination of the current Center (which is demonstrably performing admirably given the lack of administrative leadership and the paltry funding) be justified.

**Proposal to Eliminate Academic Program
Pursuant to UW Regulation 6-43
Science and Math Teaching Center (SMTC)**

Jacqueline Leonard's (former SMTC Director) response to statement for elimination of the program

In my first year as Director, I conducted a self-study that revealed several problems with the role and direction of the SMTC. First, the mission was not up-to-date and aligned with current thinking about standards, equity, and diversity. Moreover, the focus was more on the "teaching" aspect of the center, and very little emphasis was on research other than training grants implemented by the Wyoming Department of Education (WDE) under the Mathematics and Science Partnership. My vision included focusing attention on research, assessment, recruitment, and professional development to improve the status and productivity of the SMTC. The self-study and the vision were shared with SMTC faculty, staff, and board members for input.

While WDE grants were noteworthy, they only provided the University with 6-8% overhead and the SMTC with even less. Rather than focusing on state grants alone, I advocated for submission of National Science Foundation (NSF) grants that would garner 41.5% overhead (indirect rate in 2012). It is unfair to say the SMTC did not submit funding to NIH as alignment with some kind of health issue or health education is needed to do that. The University does not have a medical school, and there are currently no affiliated faculty in the College of Health Sciences. Thus, I encouraged focus on NSF and U.S. Department of Education (DoE) grant proposals. In fall 2012, I called a lunch meeting with all four endowed chairs to work with me on a Discover Research K-12 (DRK-12) conference proposal that could lead to more robust funding. Two endowed chairs opted to work with me on that initiative. Unfortunately, that grant proposal, along with another proposal submitted to the Institute of Education Sciences (IES) at the DoE, was not funded. I also called meetings with affiliate faculty in departments across the University to work on grant proposals that were interdisciplinary in focus, such as the Innovative Technology Experiences for Students and Teachers (ITEST) and the Noyce scholarship program. Four Noyce proposals were submitted by more than 20 affiliated faculty in spring 2013. The ITEST proposal and one Noyce proposal (SWARMS, Andrea Burrows, PI) were funded. The idea was to use these research dollars to support graduate students in the SMTC and to provide professional development across the state using cutting-edge technology and evidence-based practices to improve teaching and learning in STEM. To some degree these two goals were accomplished with awards of \$3 million dollars in new funding in 2013 and another \$1.5 million in 2014 (WITS, Jacqueline Leonard, PI). However, it was the resignation of a long-term accounting associate and his successors that led to low confidence in the SMTC to handle the grant funding. As a result, affiliate faculty began to submit their grant proposals through individual departments. This action undermined the capacity and reputation of the SMTC, thus, the decline in grant productivity in the last two years.

However, as noted in the proposal to eliminate the SMTC, graduation rates are above par (78 in the past five years) in our three programs (MMA, MSC, & NED). Scholarly endeavors show three faculty have disseminated an astounding number of publications (18 journals, 3 articles, 5 chapters, 1 book, 3 proceedings, 3 reports, and 2 curricula) and presentations (93 conference papers, symposia, and posters), and nearly \$10 million in funding was obtained in the past five years, accounting for the majority of research projects in the College of Education. The SMTC also recognized STEAM by sponsoring art shows in 2013 (vision, VOICE, Place Exhibit) and 2014 (Wyoming SEEN Exhibit). Furthermore, the SMTC sponsored a distinguished speaker series that included STEM educators (e.g., Chris Emdin (Columbia), Ann Rosebery (TERC), Victor Lee (Utah State University), & Edd Taylor (University of Colorado, Boulder, etc.) and a Fulbright scholar (Beverly Lindsay, The Pennsylvania State University). Thus, the SMTC has been a viable unit for the College of Education and the College of Arts & Sciences.

Nevertheless, the success of the SMTC is primarily the result of individual rather than team effort. In my opinion, the SMTC is not a cohesive unit. As such, the plan to create a new P-12 STEM Education Center that focuses on science, engineering, and education is groundbreaking. I also agree that our graduate programs and the Wyoming State Science Fair (WSSF) could be housed elsewhere. However, I do not understand how the WSSF would function under the auspices of WDE. The personnel and staff needed to conduct such a large-scale endeavor raises many questions. Where would the fair be held? Who would manage the database and track student entries? Who would ensure the projects meet IRB and SRC requirements for scientific research? Who would be responsible for judging and distributing awards? I do not see how WDE could pull this off.

Pursuant to UW Regulation 6-43, I recommend that positions be found for the tenure track, APL faculty, and staff who would be displaced by the closing of the SMTC. The appointment year for Dr. Ana Houseal is also incorrect in the online report. She was appointed in 2011 and not 2004 and is currently applying for tenure and promotion to associate professor.

Peter C. Ellsworth
48 Meadow Acres Road
Laramie, WY 82070
October 10, 2016

Dr. Laura Nichols, President

Dr. Kate Miller, Provost

Campus

Dear President Nichols and Provost Miller,

I am writing in response to the Dean's Program Review Memorandum of September 13, 2016 regarding the Science and Mathematics Teaching Center (SMTC). For the record, I have been associated with the SMTC for over 40 years, first as a student (I received an M.S.T. in 1974), then as a soft money consultant, and finally as an Academic Professional until my retirement in 2004. During most of that time I served as Coordinator of the SMTC, the position currently held by Ms. Sylvia Parker. During my years at the SMTC I taught outreach courses and conducted professional development outreach activities in all 49 of Wyoming's school districts and drove over 1.2 million miles around the state doing so. Since my retirement in 2004 I have done consulting work for the SMTC and have observed first-hand what has gone on there, especially over the last 5 years. I am currently participating in the SMTC's professional development program in Campbell County and serving as program evaluator for the Math-Science Partnership project in Fremont County directed by Jason Katzman of UW Casper. I also serve on the State Science Review Committee that created the new science standards currently awaiting the Governor's signature. I am still fairly well known and, I believe, well respected by our state's teachers and administrators. There are very few people who have had as much face-to-face time with our state's science and math teachers, or who understands their needs as well as I, or who have seen first-hand what a difference the SMTC has made in improving science and math instruction in our state. It is this perspective that prompts me to write this letter.

Regarding the dean's memo, it is not clear to me that they fully understand that the SMTC's primary mission is and always has been STEM education outreach to Wyoming teachers and administrators. Our mission is described as "antiquated" in the memo. I do not agree with that and I assure you that our teachers do not agree with that. As the only university in the state I believe that STEM outreach to teachers is one of the UW's most important

responsibilities and closing the SMTC will send a clear message that we no longer care about outreach to our teachers. I wonder how anyone could read the Program Review and not question the logic of closing such an effective program in such an important area at such an important time. In fact, the memo says "Given this long and distinguished record one might be prompted to ask why his program has come under academic program review, and rightly so."

The memorandum goes on to provide three reasons for closing the SMTC.

1. "Highly dysfunctional relationships among personnel in and among personnel in and affiliated with the SMTC". **This was a serious problem but it has been resolved and is no longer a valid reason for closing the SMTC.**
2. "Decreasing number of affiliate faculty who choose to run their grant applications or currently funded project through the auspices of the SMTC." **This problem has also been resolved and is no longer a valid reason for closing the SMTC.**
3. "SMTC's mission lacks alignment with more current conceptualizations of science and mathematics education within the broader field of STEM or STEAM disciplines on and beyond the university campus." As discussed above, **this is only true if STEM education outreach is no longer a UW priority.**

If two of the three reasons given for closing the SMTC are no long valid and the third is only valid if outreach in STEM education is no longer part of UW's mission then I believe it is more than fair to ask if closing the SMTC is the wisest course of action. I believe that the reasons for maintaining the SMTC are compelling and far outweigh the reasons for closing it. Among them are the following:

1. Recently the State Board of Education approved the new state science content and process standards and we believe that Governor Mead will sign them. These new standards will require a major professional development outreach effort for which the faculty and affiliate faculty of the SMTC are well prepared. The SMTC's efforts in this area have received national recognition (Education Week, The PBS Newshour, U.S. News and World Report among others) and are featured in the most recent issue of WYO magazine (<http://online.publicationprinters.com/launch.aspx?eid=836c194c-18dd-4783-aca5-6d2b450088bc>). The State Board of Education expects us to provide this service and if the SMTC is closed, UW will either have to forfeit its responsibility to provide this service to the state, or will have to re-invent another program to do what the SMTC already does and does very well. This is not something that can simply be handed off to other departments.
2. Dr. Richard Duschl, Waterbury Chaired Professor of Secondary Science Education at Penn State University and one of the world's leading science education researchers

recently invited the SMTC to be partners in a three million dollar NSF proposal that will put UW on the cutting edge of science education research. Dr. Duschl was here in September to work on the proposal. If the grant is funded, Dr. Ana Houseal of the COE will be Co-PI. His invitation was based on his past experiences with the SMTC and assumes that there will be an SMTC to implement the grant.

3. The new *Every Child Succeeds Act* will provide significant grant funds for professional development activities in STEM education. In Wyoming, these funds will be administered by the Wyoming Department of Education. This is a successor to the *Wyoming Mathematics and Science Partnership (MSP) program*, which was preceded by the *Dwight D Eisenhower Science and Mathematics program*, which was preceded by the *Education for Economic Security Program*, which was preceded by the *ESEA Title IV-c Educational Innovations program*. The SMTC handled UW's participation in all of these programs and is the only program at UW with the experience to move seamlessly from the current *MSP program* to the new *Every Child Succeeds program*.
4. The SMTC is a graduate program. Our teachers are all college graduates. They need graduate credit to advance on their district's salary schedule and for re-certification. A P-16 Center will be of little interest and no value to them.

The idea of moving the functions of the SMTC to a new STEM center and re-involving other colleges and programs and units has considerable merit. However, the memo provides no clear rationale as to why the SMTC must be "shuttered" in order for this to happen. Re-configuring the program will be a complex, time-consuming and one suspects in the end, a costly process. It will also eliminate the position of Coordinator which I think would be a serious mistake. The Coordinator is presently the only person with the knowledge and experience to insure that the SMTC continues to function efficiently. She is also the only person with the experience and credibility to re-establish positive relationships with our affiliate faculty. Finally, eliminating the Coordinator position will remove the last connection with A&S and at that point A&S would have no further direct role in providing STEM outreach to the teachers and school administrators of our state. That seems to me to be a terrible message to send to all of the educators who appreciate their connection and interaction with A&S, and for the many educators, including me, whose Master's degrees are from A&S. I believe that it would be far simpler to move the SMTC and integrate it into this new P-16 center. Perhaps one unstated reason for closing the SMTC is that the deans are interested in using the salary money of SMTC personnel for other purposes. **If that is the case, then I believe they should explain to our state's science and math teachers why the priorities they have for these dollars are more important than outreach in STEM education.** The memo of September 13th does not do this.

The important thing is that there needs to be a place where science and mathematics teachers know they can call on to help them improve their practice and whose primary

responsibility is to serve these educators. **I believe that the SMTC could still provide that function at a reduced level of state funding so as to do our part in dealing with the current financial crisis and I would be happy to discuss with you how that might happen.**

Finally, I would like to correct a serious factual error. The dean's memorandum states that. "In the most recent decade the SMTC has been in a gradual, sustained and marked descent in terms of its research productivity, internal and external human relationships, national and state reputation and alignment of mission with the broader field of STEM education." This statement defames the outstanding leadership provided by former Director Robert Mayes and former Coordinator and Acting Director Sylvia Parker. The SMTC was in excellent shape at the end of Ms. Parker's tenure. Morale was high and the working relationships with the staff and affiliate faculty were excellent. Over 45 affiliate faculty attended the last affiliate faculty meeting during Ms. Parker's tenure as Acting Director. I encourage you to ask Vice President Gern and former Provost Allen why, if the program was in decline under Director Mayes' leadership, did they work so hard to try and keep him here when he announced his resignation? Also, ask Vice-President Gern why, in a conversation with me, he said that he didn't understand why Sylvia Parker wasn't given the Director's position after she did such an excellent job of managing the program as acting Director after Dr. Mayes left? (The answer is that she does not have a Ph.D., so she did not apply). I also ask that you talk with trustee Wava Tully to get an idea of the impact the SMTC has had in one school district. I also encourage you to talk with former president Tom Buchanan who has been a strong supporter of the SMTC starting from the time he served as associate dean of A&S. Finally. If you have not already done so, I encourage you to read the program review and ask yourself if it really makes sense to close this program.

I am already receiving inquiries from around the state from people wanting to know why the SMTC is being closed. What do I tell them? I will be attending the State Science and Mathematics Conference in Casper, October 17-18 and will be discussing the issue with our state's teachers. What am I to tell them? If I tell them that it's for the reasons listed in the memorandum, I will also make sure that they see memorandum, the Program Review, and this letter, and let them decide for themselves about the wisdom of this move. As of today the only people who have seen the letter are two members of the SMTC staff, four of the previous SMTC Directors, Dr. Doug Wachob of the transition committee, Trustee Wava Tully and former UW President Tom Buchanan because they are mentioned in the letter and because I have sought their advice, and my attorney who recommended that I send copies to all of the trustees and members of the legislature's education committee. I chose not to do that until you have had a chance to respond to it.

I am sure that you are already tired of hearing about the problems at the SMTC, but if you wish to talk with me about it, I will be happy to meet with you. I am truly sorry that your

arrival at UW has come at such a difficult time and hope that you both will be here long enough to see UW and the SMTC return to happier and more prosperous times. With my very best wishes, I am

Sincerely yours,

Peter C. Ellsworth

Senior Lecturer SMTC (ret)

To: Kate Miller, Provost, University of Wyoming
From: Linda Hutchison, Ph.D. Assoc. Prof. Secondary Education, Mathematics Education, UW
Subject: Comment on the proposal to eliminate an Academic Program
Science Mathematics Teaching Center (SMTC)

The SMTC was one of the attractions that drew me to UW over 20 years ago. The SMTC allowed a variety of faculty from various colleges to work together to provide content and content-pedagogy for in service teachers, funded through grants and coursework. It is the blend of the content and content-pedagogy that we can provide for Wyoming teachers that is critical. One example is my NSF grant that funded the creation of the Masters program in Mathematics for Middle-level Teachers. Another example was a grant partnership formed with Jerry Hamann in Engineering, which provided on campus retraining in current technologies for the classroom and the mathematical pedagogy connections. Although the SMTC has done a lot of good work over decades, it can be improved. Some of this improvement may be achieved through incorporating the SMTC into the proposed P-20 STEM Center.

If we are to change how students learn mathematics, an organic approach to learning and teaching from both student and instructor perspectives must be considered. Content as it pertains to P-12 students must be the center of this focus. Content should be taught in developmentally appropriate ways that are honest in both rigor and future learning. While the SMTC program has made positive changes in many classrooms and districts in Wyoming, I believe this requires a years long, consistent implementation process. We cannot expect a 3-year grant to change a generation of students, nor can we consider a new set of standards to turn the heads of practicing teachers without professional support. Too much in education seems to run on a three-year philosophy. Grants are a way, however, to bring about incremental change that will help change the preparation of Wyoming K-12 students if we make a concerted effort. By pairing content with content pedagogy, many teachers have become better at what they do, which only helps P-12 students. I want to continue this work with the support of my colleagues and the university. I think this will make the university stronger because we will have better-prepared freshman STEM students and improved relations with our school district partners. This, in turn, benefits the state as a whole.

A context for the Arts & Science and Education Deans' written comments is needed. Both Deans have only experienced the SMTC at a difficult time. I believe they do not realize the good work SMTC has achieved for the state and its students over the years. Hopefully, problems with the SMTC have been resolved and it will continue, in some form, to serve State needs in the future. While some of the

problems the Deans noted were accurate, many of these problems noted have been resolved. The numbers of students in the SMTC programs, along with continued school district interest and teacher professional development, should not be ignored or thrown away. These SMTC programs did not have the low numbers identified as potential reasons for elimination. The SMTC programs are currently self-sustaining. These programs are interdisciplinary in requirements. Content in both A & S (in various departments) and Education are required to graduate. Moving these SMTC programs into the College of Education would not take into account the content offerings required in the program. Conversely, moving the SMTC programs into Arts and Sciences would not be prudent because the programs fulfill a credentialing requirement. For example, the Middle-level Mathematics Masters program is designed to include both content and content-specific pedagogy. Mathematicians and statisticians should teach content, such as those program-required mathematics/statistics courses for the masters' students (6-9 grade mathematics teachers). Mathematics education faculty should teach content pedagogy such as how to teach algebra effectively, and common student misconception research in algebra. I believe the university needs a system that brings Education, Engineering, and Science faculty together to encourage and refine STEM P-20 teaching in the state. Eliminating the SMTC before incorporating the P-20 STEM Center might have the following ramifications:

- Scholarship dollars might not follow the intended programs as these funds move to a college and then to the P-20 Center. A concern for donor wishes should be evidenced.
- Efforts with partner districts, various departments, State Board of Education, and the Wyoming Department of Education have established positive relationships. Elimination could destroy a relationship with many internal and external partners that have been a part of the SMTC program since the 1970's.
- NSF grants such as those that created the Middle-level Mathematics master's program would be more difficult to obtain because a ready-made home that crossed college and discipline faculty lines would no longer be available.
- The Science Fair, currently administered by the SMTC, is a great recruitment tool for recruiting quality STEM students in Wyoming. Losing this critical recruitment tool for Wyoming's bright STEM students would do a disservice. UW STEM faculty have the opportunity to interact with and recruit these students by participating in the Science fair with no travel costs. The Science Fair fits naturally with the SMTC mission and should fit naturally into a P-20 STEM Center.

Constituting a potential P-20 STEM center and including the programs and faculty of the SMTC into it would be the win-win situation for all of the STEM groups on campus and across the state. I realize that it might take a few years to establish the P-20 STEM center, but Science and Mathematics faculty housed in Education (currently affiliate with SMTC) must be a part of it if it is to succeed. P-12 teachers, not just students, are needed and those of us who worry about and research content and content-specific pedagogies in mathematics and science will be beneficial for the team. I recommend that the elimination of this program be put on hold until a P-20 STEM center is established that could incorporate the functions and resources of the SMTC into the larger P-20 STEM Center mission.

Subject: FW: SMTC

Date: Thursday, December 8, 2016 at 10:15:38 AM Mountain Standard Time

From: Wilma A. Varga

To: Program Review - Academic Affairs Office

From: Judith Z. Ellsworth

Sent: Thursday, December 8, 2016 10:06 AM

To: Program Review - Academic Affairs Office <progrevw@uwyo.edu>; Office of the President <uwpres@uwyo.edu>; Wilma A. Varga <WilmaV@uwyo.edu>

Subject: SMTC

December 1, 2016

Dear Program Review Committee, President Nichols and Provost Miller:

I am writing concerning the proposal to close the Science and Mathematics Teaching Center and distribute some of its responsibilities among different departments/programs on campus. My history with the SMTC is over 30 years and through a variety of associations; as a project director for several Title IV-c grants, a lecturer in elementary science and mathematics education for the College of Education and then a faculty position after completing my PhD at the University of Washington, the Director of the SMTC for 4 years, and the Associate Dean for Undergraduate Education in the College of Education for 3 years. During all that time, I was an active faculty member in the SMTC as an affiliate faculty in the SMTC, often on the SMTC Advisory Board including when I was the Associate Dean, and as the Director. My office (with the exception of the Associate Dean position) was always in the SMTC. Based on my experiences, I am keenly aware of the programs that have been offered through the SMTC over those years. I helped define both the current middle-level science and middle-level math master's programs (MSNS degrees), helped develop the association with the Teton Science School which became a third MSNS option, was the project manager for a large NSF mathematics grant during my term as SMTC director, and sat on numerous SMTC master's committees as the chair and/or a member. It was also during my term as SMTC director that we received endowments which, with a legislative match, amounted to approximately \$1 million dollars; monies we used to support programs and Wyoming teachers in their master's work.

To say that the SMTC has been a strong influence on science and mathematics education in the state would be an understatement. It was often the first point of contact for both teachers and school administrators when they needed help with science and with mathematics education. The SMTC either delivered what was needed or put them in contact with UW faculty members who could help them, both from the College of Education and the College of Arts and Sciences, and often from the College of Agriculture and College of Engineering as well. As these faculty/public school interactions grew, so did faculty participation across the university in the SMTC as affiliate members (numbering well over 50 until the last few years). Many Wyoming teachers were able to get their Masters of Science in Natural Science (MSNS) at the University of Wyoming because of the SMTC and the way they scheduled courses and supported teachers. These were masters' programs built on the joint planning and instructional efforts of Arts & Sciences and Education faculty members (as well as other colleges) and were rigorous programs. The uniqueness of these masters' programs was that they provided opportunities for teachers in a timeframe that fit their profession. These teachers were beyond K-16 offerings from UW and could not do the full-time graduate programs. SMTC was a beautiful blend of 3-4 weeks in summers where teachers could be face-to-face and then online, compressed video and more recently skype meetings during the year.

The SMTC, however, was important beyond its ability to offer academic programs. In a state where many districts only have one or two junior high/high school science teachers and the same for mathematics, teaching all the topics involved in those content areas can be a lonely profession with few colleagues. The SMTC connected teachers in ways where teachers grew comfortable contacting each other when they needed help or ideas. This was one benefit of the face-to-face and online combination courses and graduate programs. Teachers began to develop statewide colleagues and the number of science and mathematics public school teachers who knew others from other districts was quite amazing. Teachers returned to take courses and went to state conferences/meetings to maintain those relationships as well as to engage professionally in new content and ideas. Wyoming science and mathematics teachers were engaged and informed teachers, in part due to their relationship with the SMTC. I was just recently looking at a past newsletter offering "teacher as researcher" opportunities through a Title IV-c grant (1990). This project brought teachers together with faculty researchers on campus and in the state to learn good research techniques which could then be transferred to classroom practice where applicable. Teachers worked in the summer with faculty researchers and received acknowledgment on papers that were published. Though this is an older grant project, I am using it as an example of the scope of opportunities offered over time. This project was recognized as an exemplary program by the National Title IV-c office in a presentation in Washington DC. During 3 summers, research collaboration projects were offered by faculty members in Agriculture (Plant and Soil Science, Animal Science, Range Management), Botany, Physics and Astronomy, Anthropology, Zoology and Physiology, and Chemistry (32+ projects). In addition, there were also field project studies offered by Wyoming Game and Fish, Bureau of Land Management, US Forest Service, National Park Service and several science departments in Wyoming community colleges. These opportunities were provided in locations across the state. This is an example of the importance of science and mathematics content working with education. A current example of work through the SMTC is the Gillette project where UW faculty (education and arts & sciences) are working with teachers K-12 to understand the new science standards and develop and implement instruction in the classrooms that will address these standards in quality ways. This has been a 4-year project allowing teachers time to grow in their thinking about science and how it should be taught, and to develop a colleagueship across the district. This project was reported by the national PBS channel as well as in many state forums. While this is only an old and a new example, projects of quality happened every year.

It was also through the SMTC that teachers were also introduced to leaders in the field of science and mathematics. The SMTC often offered workshops where professionals such as Dr. David Hawkins, Dr. Irv Sigel, Dr. Drew Gitomer, Dr. Richard Duschl, and others would come to work with the teachers, not to give a lecture and leave but to be there for several days or a week engaging with the teachers. These professionals often returned because of the quality of those interactions.

Over the years, the SMTC brought in millions in grants through the collaborative efforts of faculty from Colleges of Arts & Sciences, Education, and other UW colleges. Through these grants, they offered a variety of opportunities to Wyoming teachers (as exemplified above) from elementary through high school as well as graduate students on campus. These grant monies were also not insignificant to the University as a whole, as the indirect costs supported needs across campus.

There is much to say about what the SMTC has accomplished and I imagine others have described other aspects not mentioned here. A critical point for me, as someone who has been part of the SMTC for many years, is something hard to describe. It is a sense of being part of the Wyoming science and mathematics education community (both on and off campus), of going into any school and knowing teachers/administrators who have been part of this effort, and of an ongoing engagement in learning. I am afraid this cannot be duplicated by assigning different departments different parts of the SMTC work. Some courses/programs might be delivered, but the connections to a university and a state community and to colleagueship (both between Wyoming teachers and between teachers and UW faculty) will not be as strong.

I respectfully ask that you reconsider this decision.

Sincerely,

Judith Ellsworth, PhD

UW College of Education (retired)

The Science and Mathematics Teaching Center (E.G. Meyer)

I am writing to support the SMTC, but first some history. In the mid 1960s Derek Prowse, Professor and head of the Physics Dept, having just hosted a national meeting of the American Association of Physics Teachers called me (Dean of Arts and Sciences) and suggested we have a talk about science education. The result was that we felt it mandatory that the University of Wyoming do something to promote excellence in educating science teachers. After some discussion we decided to apply to the National Science foundation for a program that combined its then array of "institutes". So we prepared a grant application that would do three things: offer a degree program in science for quality science teachers involving a full year on the campus and resulting in an M.S.N.S degree; provide a summer program in science for science teachers; and establish Pilot schools around either the MSNS graduates or those who attended the science summer program in Wyoming around whom the entire science program could be improved. The application was met with concern by the NSF since it did not address an existing program. But fortunately the head of the Education Division said it should be reviewed and established a group to do so. In due time we were notified that not only had the grant been approved, but that because of its uniqueness the NSF Director asked Prowse and me to come to Washington for the award ceremony. The grant was for a three years at between \$0.8 million and 1.0 million (don't remember exactly) per year. So we had about \$2.5 million (which in the middle 1960s was a ton of money) to establish a first-of-a-kind comprehensive program in science education.

In accordance with the terms of the grant, we established the SMTC as a joint venture between the College of Education and the College of Arts and Sciences. We then appointed Professor Sam Harding, a long-time member of the Physics Dept to head the Center. Prof. Harding in consultation with Lawrence Walker (Dean of Education) and myself appointed a faculty of four and an individual who was charged with visiting Wyoming high schools to exchange information. All were jointly (50-50) in both Education and A&S.. The "circuit rider" became essential as Pilot schools were established. The office was staffed with a secretary. We acquired space and got Course Committee approval for the MSNS. There was a battle to get NCATE to approve the course-work in the Center for Certification Credits for the teachers, but with Walker's support NCATE did approve. We advertised nation-wide for applicants with the requirement that their school boards would continue half of their salaries during the year (with grant funds we gave the balance and a living expense and travel award), and were flooded with applicants. Every year this was the experience, and graduates kept in touch with the Center to report on the value of the experience. Moreover, the reputation of the Center was first regional and then national. Members of the faculty were asked to give talks on the concept and structure of the programs and their operation.

The first three years of operation were grant supported, but it was noted in the NSF application and approved by President Bill Carlson that State funds would be needed in the long term. So, while the Center faculty continued to obtain grants, the two Colleges budgeted support.

The above information is factual, but now I wish to give an opinion. First, what was then the purview of the SMTC is now categorized as STEM education for teachers. It is more important than ever. It deserves a "home" on every campus that purports to be interested in STEM education. Dispersal to several departments will not work. Additionally it must be focused. Teacher training in STEM subjects differs greatly according to the grade level. Thus K-6 teachers need different subject matter and different teaching skills than high school teachers need. In fact K-6 itself cannot be considered a single entity for STEM teaching. And as to college teaching, that, in my opinion, is so different that it should not be housed with STEM teaching. Science courses taught by science faculty in a setting such as SMTC seems to me to be the right way to be active in the preparation of STEM teachers. The so-called concurrent major is not the solution, as the courses needed by teachers are not the same as courses needed by departmental majors or minors. Further the breadth in the subject cannot be achieved. The beauty of the SMTC was that the courses taught for the MSNS had the Chemistry or Physics or Biology or Mathematics orientation, but they were designed and taught especially for teachers. Incidentally, that does not mean these courses were "watered down", but rather addressed the subject so as to give teachers confidence and the ability to teach in a manner that produces genuinely knowledgeable students.

So in summary, I do not wish to make comparisons with other non-departmental units on the campus, but rather to state the absolute value of the SMTC to the State of Wyoming. In the State's attempt to diversify it is inevitable that a supply of STEM students is essential which makes a supply of STEM teachers essential. BTW, Sandra Postel, one of the four recently recognized Distinguished Alumni an MSNS from the SMTC that enabled her to get started with Boeing.

Connie Nerby

25 Timba Bah, Atlantic City WY 82520

othermosthouse@gmail.com

November 6, 2016

Dr. Laurie Nichols, President

Office of the President

1000 E. University Avenue

Laramie, Wyoming

Dear Dr. Nichols,

At 8:30 in the morning, a high school biology teacher chats with an elementary colleague about essay responses from his latest classroom assessment. They look forward to hearing their high school modern language colleague share the insights she gained from interviewing students to discover their misconceptions about the structure of language.

Another room, another day and another project and middle level teachers representing each of the Wyoming common core disciplines sit at a long table struggling with how to identify deep, conceptual understanding in each of their content areas, taking a first critical step to improving their skills at designing and implementing strong and valid classroom assessments to provide evidence of significant and sustainable learning.

The silence in another room on another day reflects the intense concentration of high school algebra teachers reading the shared responses elicited from students by a department designed classroom performance assessment. They have been through this before and are well aware of the well-structured protocols they will follow for sharing student work.

A summer morning finds the district board room filled to capacity with teachers from across disciplines and grades, representing a range of controversial viewpoints regarding the role of ranching in their community. Many arms are crossed on day one of their journey into the science, culture and history of Wyoming agriculture, but journal entries recorded throughout the project will provide evidence of the significant conversations that begin to break down old "rangeland fences" and bring discoveries about collaboration and negotiation...conversations that will ultimately go on to raise the quality of experiences offered to students.

Heads at a small table are bent over two containers of different shapes. An elementary math teacher is sure that his prediction of which container will hold the most popcorn will be proven correct. Or is he so sure?

Each of these events took place in a Wyoming School District either as a direct result of participation in a University of Wyoming Science Math Teaching Center Project or as a direct result of professional consultation provided by SMTC leaders to teacher and curriculum office leaders in the district.

I know because I was there, not only for the individual examples mentioned here but for the many and frequent additional rich conversations among colleagues that took place outside of these events as a result of participation. And so, yes, I am asking you to give the recommendation to eliminate the Science Math Teaching Center a second look. In a leadership position such as yours, time is limited and precious. I do not take my request for your time to review my further explanation and arguments for continuing support for the SMTC lightly and thank you for any consideration you can afford.

To begin with, three critical factors came to play in the significant and sustainable effect that each of the SMTC projects described above had on individual teacher growth in my district. First, all of the projects included in-depth, long term, on-site support from the SMTC. This outreach model allowed for teachers to reflect on and apply in their classrooms between sessions the techniques shared at professional development events, returning with new questions and insights to share. Secondly, all of the projects were based on teachers learning from each other, under well facilitated guidance from SMTC partners. Finally, representing the almost always missing factor in professional development models, SMTC partners brought to the table their understanding of the substantive question facing classroom reform efforts. If we do not agree about how kids learn, it does not matter whatever else we may agree or disagree on. These projects were structured to ask the right questions...that is, those questions that may not have right answers but that will find teachers questioning their own thinking.

So now, as a Wyoming citizen, a retired educator still passionate about the future of public education, and the parent of two University of Wyoming graduates, I propose what I hope will serve as "right" questions, intending to prompt the discussions which will assist your decision making team in considering the SMTC Review recommendation for elimination.

- 1) The first two reasons given in the *College of Arts and Sciences and College of Education Deans' Program Review Memorandum*, dated September 13, 2016, apparently refer to personnel issues which emerged within the SMTC within an unspecified time in recent history. Apparently, these issues led to withdrawal of support for the SMTC partnerships from other university departments and partners. The *Memorandum* suggests a high turnover of SMTC staff, which would certainly lend to instability within a department, especially in the oversight of multi-year grant projects. My tenure in a school district central curriculum office found issues arising that intersected with our human resources office, and also required a fairly thorough familiarity with the district policy book. I would be surprised to learn that "dysfunctional relationships among personnel" would be remedied by eliminating a department, especially given the previously longer history of the successful reputation which was built prior to the disruption, as is the case with the SMTC and described in the *Memorandum*. What is the university's general policy on addressing personnel issues within either an academic or administrative department? Is there a policy or precedent at the university level which outlines department elimination as a usual option for cases in which personnel issues are allegedly hindering program effectiveness? When former partners were interviewed in the course of the review, was the "erosion of confidence" tied primarily to these personnel issues? At the university level, what entity would be responsible for overseeing these types of issues when it became apparent that they were affecting services offered by the University to its faculty and to its constituents? Who was responsible for allowing the pattern of turnover to continue? The raw question from an outsider, a taxpayer, and a former tuition payer becomes "How did the personnel evaluation process fail and consequently allow a highly reputed department to become ineffectual over such an extended period of time?"
- 2) The third reason cited for the elimination of the SMTC states that "the mission lacks alignment with more current conceptualizations of science and mathematics education within the broader field of STEM or STEAM disciplines." I have described for you in this letter specific snapshots from the ongoing professional development videos offered to teachers and administrators in my district over the course of a decade. These approaches were more precisely, consistently, and comprehensively aligned to proven principles of professional development and best practice than any other models I participated in or observed as a classroom teacher and curriculum office leader

in my 32 year career. I reread the mission statement listed in the *SMTC Academic Program and Unit Review* document, dated September, 2016, to make sure a change in SMTC philosophy had not occurred since my retirement. I found none. Now I must assume the "more current conceptualizations of science and mathematics education within the broader field of STEM or STEAM disciplines" referenced in the Memorandum represent some significant change in philosophy from the national standards movement of earlier decades that I am familiar with. And yet, if the current STEAM discussions are representative of larger conversations within the STEM disciplines and current educational trends in general, I am surprised at the judgement of misalignment. It appears that interdisciplinary connections and a renewed cry for deep, conceptual learning are being allowed out into the light again, after the recent years of turmoil created by an accountability and testing frenzy. The application of the SMTC mission that I witnessed, while resting firmly in the original STEM fields, dovetailed perfectly with cross-disciplinary projects and thinking, bringing a "scientific reasoning approach" to the analysis of instruction across contents and grade levels. From that perspective, these questions remain. How have the "current conceptualizations of math and science education" changed to render the SMTC professional development models antiquated? Specifically, how has the intent of the original National Council of Teachers of Mathematics documents and the concurrently emerging science standards documents to which the SMTC mission is well aligned, changed in the most current revisions of standards documents ?

- 3) Item #3 of the *Memorandum* also addresses the role that the SMTC is apparently unable currently play to enhance the STEM mission on campus. To be clear, the University's first obligations are to its current students and its support for the instructional and research efforts of its faculty. On the other hand, the high quality preparation that it provides in its undergraduate and graduate programs becomes the companion to its other role, as a leader in pursuing best practice and innovation in the greater educational arena. Furthermore, If the national P-20 initiative is to be more than merely the latest rehashing of the ineffective articulation initiatives of past decades and if the University sincerely believes such large scale articulation is a noble goal, surely support of outreach programs that connect working classroom teachers with each other and with university content experts as partners in research and implementation of best practice must also be a priority. Apparently, the expectation for the SMTC was to serve both the ends of building STEM connection capacity on campus and off campus. Regarding the former, is it reasonable to assume that interdisciplinary discussions and the "intellectual leadership across the university to...connect the disparate bits and pieces of faculty and staff interests in STEM disciplines into a broader university-based STEM focus" should be at least partly the responsibility of those individual departments? How would eliminating a structure which had begun forging those interdepartmental connections be more time and cost effective than resolving personnel issues, allowing it to return to the sound work it was about prior to the disruption and may have maintained on at least some fronts during the disruption? In so doing, would it not be likely to rebuild confidence lost so that the Center could then redouble efforts to work on campus as well as off campus to achieve its mission? What is the frequency, duration, and impact of other university programs which serve the goal of off campus K-12 outreach? The *Memorandum* suggests the establishment of a "University P-16 Stem Education Center." How would a new alternative's mission differ from the original vision of the SMTC's role? The nature of its suggested title implies that it must involve K-12 school districts. If the SMTC is eliminated, how will its rich history of experience in effective outreach be saved and transferred to any new structure that may replace it? How will an alternative approach to outreach look different

and insure that projects will be as well-aligned to high quality professional development standards as the projects that earned the Center its original reputation? Or will the new structure be primarily concerned with providing leadership within university departments currently suffering from the lack of coherence on campus stated in the *Memorandum* and leave outreach to K-12 partners as a lesser priority? So goes another generation of articulation rhetoric that leads to little significant action.

- 4) Lastly, the *Memorandum* states that the organization of the three master's degree programs into the SMTC is "a somewhat aberrant organizational practice since degree programs are typically housed in academic units" and recommends moving them to departmental academic homes. If the current state of STEM affairs at the University is lacking in coherence and the "intellectual leadership" to "connect the disparate bits and pieces of faculty and staff interests" how will the integrity of the SMTC degrees be maintained when the vision which created them is not necessarily shared?

Twenty-one years as a junior high language arts teacher and teacher leader at the building and district level, followed by eleven years in the same district's curriculum office, as a grants coordinator, assessment specialist and professional development facilitator at a time when every district in the state struggled with a new look at graduation requirements and the politics which tumbled teacher and district leaders into chaos, followed by five years working in the field of grant funded program evaluation taught me some things about being a change agent in the world of education. Mostly I learned what didn't work, even when it was a model espoused by an expert, made trendy in a book with the same title and written by an author appearing on the dais of national conventions, or peddled by a state department as a single, simple solution. But I did learn this. Significant and sustainable educational reform will be a matter of evolution rather than revolution, as much as some of us would prefer the latter. Individual growth for systemic and systematic change will result from the consistent application of the kinds of professional development work modeled by the Science Math Teaching Center. I also learned that Pogo, the comic strip sage of yesteryear, was too often right. We have met the enemy and it is us. Educators are slow to understand change, when they should be at its forefront. Change for the right reasons means exploring the right questions, reasoning like scientists rather than sailors who jump to a new ship with newer sails heading in the same direction as the old one that simply needed some maintenance to keep it on course. Steering a whole fleet of university ships must be a daunting challenge but having earned the right to do so proves you deserving of the ultimate respect. I hope that you will find that I have found some "right" questions to ask in urging you to give this decision further consideration. And, I sincerely thank you for your time and your service to Wyoming.

Sincerely,



Connie Nerby

CC: Dr. Kate Miller, Provost
Program Review Committee

Subject: SMTC comment
Date: Sunday, December 4, 2016 at 2:10:08 PM Mountain Standard Time
From: Anna Kluver
To: Program Review - Academic Affairs Office
Attachments: SMTC review response.docx

Area 4

December 4, 2016

To Whom It May Concern:

As a current student in the Science and Math Teaching Center working on my third year in the Masters in Middle Level Science degree program, I believe termination of the SMTC would be a mistake. One of the most effective functions of the center is the development of relationships with districts and teachers across the state of Wyoming. Without the outreach portion of the SMTC, I very likely would never have heard about the degree programs offered by SMTC. The work that the SMTC team has done with my district in developing a district-wide science curriculum is outstanding. The curriculum is solidly based on the Next Generation Science Standards. The curriculum jointly developed by teachers and the SMTC team is implemented in third through sixth grade and will soon be implemented in kindergarten through the second grade across the district.

Your report stated that the SMTC is not keeping up with current science and technology practices. I disagree with this statement. SMTC uses technology to connect to distant students like myself. The center uses technology in innovative ways to engage teachers in an effort to get them to use it more effectively in their everyday teaching practices. Some examples of SMTC's use of technology are as follows. The fall Research Methodology class is run at least half of the time through a video chat. The instructor has explored and used the technology so that it enhances the content and in no way hinders it. The Spatial Data Instructional Technology course I took last summer introduced ways I could integrate my curriculum and technology more effectively. The tour of "the cave" opened my eyes to the possibilities of data representation I had never considered before.

The coursework and pedagogy classes are rooted in the concepts stressed in the Next Generation Science Standards. This is a very current source of information and material for science education practices. Instructors work very hard to keep the courses offered by the center relevant and up to date.

I would also add that the faculty appears to be very conservative with the funds. There seems to be no extravagant or wasteful use of funds visible in the facilities that house the SMTC. As a student, I feel a huge focus is on students and helping them to succeed in their academic goals.

Finally, I would not have considered investing my time and effort on top of a costly college tuition to pursue my masters degree. The generosity of Sigrid See and others who believe in the mission of the SMTC made the decision to invest in my future much easier. On this topic, I am concerned that the donators may not want to continue funding if the program is significantly changed.

Please consider adjustments and enhancements to the SMTC before you decide to dissolve it. Also, I would be glad to answer questions or discuss this issue further if needed. My contact information is: akluver@ccsd.k12.wy.us or phone: 307-299-0040.

Thank you for carefully examining the effects of this important decision!

Sincerely,

Anna Kluver
Gifted and Talented Teacher
Campbell County School District #1

I do not feel obliged to believe that the same God who has endowed us with sense, reason, and intellect has intended us to forgo their use. – Galileo Galilei

Subject: The closure of the SMTC

Date: Sunday, December 4, 2016 at 5:04:17 PM Mountain Standard Time

From: LeAnn Uhling

To: Program Review - Academic Affairs Office, Office of the President, Wilma A. Varga

Dear Program Review Committee, President Nichols and Provost Miller:

I am writing in response to the recommended closure of the Science and Mathematics Teaching Center. As a land grant institution, the University of Wyoming is obligated to support Wyoming teachers and the SMTC exists to do just that! I have taught for a total of 28 years in Wyoming, first in Evanston and now Saratoga. Over the years I have taken numerous classes, some taught by Joe Stepans, Pete Ellsworth, Ana Houseal and others. Some of the very best professional development I have received and my school district has benefited from has been through this center. I was one of the teachers who dedicated 3 years participating in the Math and Science Partnership grant with UW and Teton Science School. I returned to my district, Carbon County School District #2, ready to lead our district in science reform; implementing Place Science and Civic Engagement. I was fortunate to be able to present twice in Washington DC at the MSP Convention about the PLACE science training which helped me grow as a professional; resulting in the growth of my students! It was so exciting to ignite the spark in teachers from all over the nation wanting to use our state as an example of success. Furthermore, I am a member of the district science committee and worked with faculty from the SMTC and district personnel on aligning classroom units and lessons to the Wyoming standards. With the recent approval of the state science and content standards, SMTC will be called upon for assistance based on past experience and the positive relationship it has with Wyoming teachers. Working in one of our small, rural districts in the state, the outreach SMTC has provided has been invaluable. As a 2010 Presidential Award of Excellence in Mathematics and Science Teaching, I cannot begin to express the importance of STEM (STEAM) education. While in Washington DC I not only met President Obama, but I also met teachers from all over the nation who wanted to improve their practice. I was able to brag about the important partnerships within our state which support teacher professional development, SMTC being at the top of that list.

Thank you for your consideration,

--

LeAnn Uhling, NBCT

Kindergarten Teacher

"If your path has no heart, leave it." -Amazonian oral tradition

To whom it may concern,

I was associated with the SMTC from the writing of the initial NSF proposal until my retirement 22 years ago. The SMTC was initially located in the Physics Department and then became an interdisciplinary program along with Women's Studies, American Studies, and others. I served as Coordinator and Director. I have not kept up to date on UW's financial situation except to understand that it is dire, so I have nothing to say about where the SMTC fits into the overall picture, but I do have two comments:

1. I have read Pete Ellsworth's letter and if he is correct about the three reasons for "shuttering" the Center, then the dean's memorandum does not make sense.
2. I absolutely hate the idea that A&S would withdraw from its responsibility to provide professional development to our schools. The SMTC was the original academic home of the SMTC and the content knowledge that our A&S faculty provide is the intellectual backbone of our courses and workshops. Collaboration between A&S and Education is not easily accomplished, and will not happen without a person whose specific responsibility is to make it happens.

Sincerely,

Vincent, G Sindt, MS.
Associate Professor of Physics (ret)



COLLEGE OF EDUCATION
MONTANA STATE UNIVERSITY BILLINGS
DEPARTMENT OF EDUCATIONAL THEORY AND PRACTICE
1500 UNIVERSITY DRIVE BILLINGS, MT 59101-0298
OFFICE (406) 657-2315
FAX (406) 657-2104 E-MAIL KMILLER@MSUBILLINGS.EDU

December 4, 2016

Dear Program Review Committee and Provost Miller,

My name is Dr. Kenneth Miller. I am a product of the University of Wyoming with a Masters from the College of Arts and Sciences and a Ph.D. from the College of Education. I am now a full professor at Montana State University Billings, Department Chair, and more importantly, a Distinguished Alumni Awardee from the University of Wyoming's College of Education's 100th Year anniversary. That, by the way, was a very proud moment in my career. I started my career in Wyoming as a classroom teacher and was personally mentored by Arts and Science and Education faculty in the Science and Mathematics Teaching Center.

Within the last three years, my institution went through Academic Program Prioritization, as it appears that your institution has and is completing. I was on the campus lead committee for this program prioritization and from that know that this is a difficult and somewhat turbulent time for the committee as well as those affected by significant change. From that experience, I also know that many of the decisions made could not be weighed in a black and white or an easily contrasted manner. In fact, understanding the ramifications of a program decision and trying to extrapolate beyond the intrinsic and immediate needs, whether financial or personal, was difficult at best.

The MSU Billings Academic Program Prioritization committee, included data generated from the campus administration, faculty, and staff involvement in the program evaluations/decisions. But, more importantly, input from the off campus, statewide and regionally, was specifically useful to determine some of the possible ramifications to outreach and perceptions any decision could generate. I found this off campus input particularly useful for our committee decisions as they generated value beyond the sometimes capsulized perceived needs within the university. Because I found this input from regional and state constituencies valuable, I see the need to write to you from that perspective. I can provide some of that input for your committee decisions.

I have read the two Deans' letter to the Provost Kate Miller. They have written their letter stressing a lack of support for the Science and Mathematics Teaching Center based upon three points. I have no history or understanding regarding the first two points. As a leader, you realize more than anyone that lack of direction and infighting is usually a lack of leadership from the immediate supervisory. The third point, however, I certainly can address.

The outreach provided through SMTC has a long and productive history. I became involved with the center early in my career as a teacher in Wyoming. I worked side by side with several prominent professors and instructors who shared a common insightful goal regarding STEM education for the teachers in Wyoming. I worked with Drs. Ron Beiswenger, Jim McClurg, Patricia McClurg, Audrey Kleinsasser, Joseph Stepan, Duane Keown, and the list goes on. Directors of the center like Vince Sindt and Judy Ellsworth were instrumental in leading a combined center with different research paradigms. However difficult it was to manage STEM faculty and STEM education faculty research was sound. Through diligent leadership, faculty were encouraged to work together toward a pragmatic

understanding regarding the need for the preparation of teachers in the state to be better prepared to teach STEM topics in this state.

Montana has worked side by side with Wyoming as the state educational agencies began the long process to implement and design new exciting standards in STEM. Leading that way in Wyoming were members of the SMTC. While the work to write these new standards was intensive, the biggest need now becomes the professional development for our teachers who will now need to implement the standards. Because of the SMTC's up front work in the writing and design of these standards, the active members of the center stand postured to begin the professional development process throughout Wyoming schools. Restructuring, shaking up, or shutting down the SMTC will certainly disrupt this process in a most serious way both in knowledge of the movement and gaining dollars through grant funding. To me, closing the center is a serious suggestion from two Deans who appear not to have a history or an understanding of the unique power of a center that spans two colleges, interactively and progressively working together. Indeed, it appears that neither fully understands the current importance placed on STEM education.

The Science and Mathematics Teaching Center has played an important role in science and math education for decades. The center is foundational for the immediate and long-term future of STEM education not only in Wyoming but for surrounding states. Closing this entity does not appear to be in anyone's best interest, from my perspective as a science educator and as a professional who prepares future science educators.

Thank you for allowing me to voice my perspectives and for considering them in your Program Prioritization deliberations.

Kenneth Miller

Kenneth Miller, Ph.D.
Chair and Professor
College of Education
Montana State University Billings
Billings, MT 59101
406.657.2034

Subject: Comment on the review of the SMTC

Date: Tuesday, December 13, 2016 at 10:44:05 PM Mountain Standard Time

From: Nick K

To: Program Review - Academic Affairs Office

Dear Academic Affairs,

I am writing to you to express my support for the SMTC. I read through the "Proposal to Eliminate Academic Program" as well as the SMTC's report to the Deans. As I understand it, the argument is being made that the SMTC has become outdated and unnecessary and that the functions it performs could be carried out to a higher degree by other departments.

My response to this argument comes from my own experience. I completed the Teton Science Schools (TSS) Graduate Program in 2015. One large factor that led to my enrollment at TSS was the prospect of completing my MS through the SMTC. Thankfully, when I did arrive at the University of Wyoming (UW), the transition from my experience at TSS into the classroom and research process at UW was almost seamless. The courses, discussions, and academic advising that I received during my year in the SMTC was challenging, encouraging, and productive. While I am sure that the specific majors and courses offered by the SMTC can be taught through other departments, the academic experience offered by the SMTC is unique and effective. Many of my fellow SMTC graduates have gone on to become educators in public and private schools, science centers, conservation programs, and even at UW. In January, I will begin a new position as a lead teacher and summer program coordinator at the Jackson Hole Children's Museum. As someone who went through the program, the SMTC offers a valuable and effective educational opportunity.

After reading through the proposal to eliminate the SMTC, I can see how the University could come to some of their conclusions. Some of what was mentioned was not familiar to me. One aspect stood out to be missing from that proposal. Sylvia Parker and Ana Houseal both made a tremendous impact on my academic experience. Sylvia Parker especially was wholeheartedly dedicated to my success and to the success of my colleagues. Sylvia is very well acquainted with TSS and is therefore able to welcome incoming graduate students to the SMTC in a way that propels them forward with little interruption. If you do choose to let Sylvia Parker go from the University of Wyoming, it will be your loss. She is tirelessly dedicated to helping her students become teachers who are passionate, inspired, and committed to their local communities and landscapes. She is an important member of the UW and Laramie communities and will be missed by many if she is unable to stay. Please strongly consider offering her a new position that will continue to utilize her gifts and talents in similar ways as she is able to do at this time.

Thank you for your time.

Sincerely,
Nick Koinis

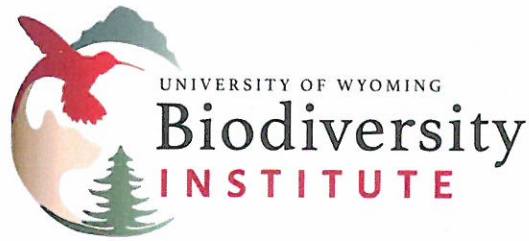
--
Nick Koinis

(941)916-1549
nick.koinis@gmail.com

Provost Dr. Kate Miller
Office of Academic Affairs
Old Main

December 14, 2016

Dear Dr. Miller,



The document recommending the elimination of the Science and Mathematics Teaching Center (SMTC) presents a strong argument for maintaining the department, especially its long history of supporting classroom teaching and educational leadership, and its cadre of successful and loyal graduates. The primary arguments for elimination are related to recent failure of leadership at SMTC; that specific problem is no longer relevant. As the document states, "SMTC has been nurtured by scores of visionary academics..." indicating that the recent problems faced by SMTC were the exception, not the rule.

It is true that UW should expand its P-16 education role, but eliminating the program that has provided leadership in that role, and its coordinator and acting director, Ms. Parker (an extremely well liked and respected ambassador for UW) would be a terrible loss to the University. SMTC has built a network of educators and programs across the state and at UW, and a reputation for excellence, that should be the foundation of an expanded P-16 education initiative.

Furthermore, elimination or replacement of SMTC, or the discussion of those possibilities, is premature at this time, when there has as yet (to my knowledge) been no discussion of the vision of the proposed new STEM Education Center. In my experience, university STEM centers frequently become focused on outreach and recruitment for the university—that is to say that they serve the university first, and support P-12 educators only nominally or as an afterthought. While those services to the university are important, they would not be a substitute for the services provided by SMTC across the state—providing professional development necessary for teachers to excel in their chosen STEM fields. This has become more important than ever in Wyoming, with the adoption of the new Wyoming Science Standards, which require teachers to take a different approach to science education than many have had, or, in the case of elementary grades, to include science in the curriculum for the first time.

I strongly urge you, Dr. Miller, to reconsider the proposal to eliminate SMTC. The unit performs a very significant service to the K-12 education community across the state, and enhances UW's reputation through its professionalism and outwardly-directed support of science education. With university support, SMTC could, and should, be leading UW into a new era of P-16 education leadership.

Sincerely,

A handwritten signature in blue ink that reads "Dorothy Tuthill".

Dorothy E. Tuthill, PhD
Associate Director
Biodiversity Institute
Berry Center

Subject: Keep the SMTC

Date: Wednesday, December 14, 2016 at 3:16:37 PM Mountain Standard Time

From: Linda Baggus

To: Program Review - Academic Affairs Office

In an era when most states have stagnant or declining scores for students in math and science, scores for Wyoming students have increased. Don't you think that the fine work of the SMTC has contributed to that? Please keep the SMTC.

Linda Baggus
former Director
Green City Project
Connecting Students with Nature int their own Communities.

Subject: SMTC Program Review

Date: Wednesday, December 14, 2016 at 7:24:55 PM Mountain Standard Time

From: Leah Ritz

To: Program Review - Academic Affairs Office

I understand the current budget constraints at UW and the need to cut some programs, but I encourage you to reconsider eliminating the SMTC program. SMTC is one of the only programs on campus, and one of the only branches of the education department, that collaborates with the myriad other departments at UW. Not only that but SMTC has made incredible connections with dozens of teachers and other educational programs around the state. SMTC is the "go-to" department for many of the teachers who seek resources from UW but do not know who to contact. The staff of SMTC are incredible connectors of people and producers of unique, creative ideas that have strengthened UW and the state of Wyoming.

I am a alum of the SMTC graduate program that partners with Teton Science Schools. Without this program and the resources I was provided (human capital and financial), I would not have a masters degree today. I was pushed and challenged by the SMTC staff to produce my best possible work and, to date, my Plan B thesis on educational strategies for the 3D CAVE in the School of Energy Resources has been downloaded hundreds of times by people all over the world and I was recently interviewed for my experience in the area by a professor from Cochise University. The quality of academic work that comes form the SMTC is very high and has impacts all over Wyoming and the world.

No program on campus can support STEM education in Wyoming like SMTC and instead of eliminating, I encourage you to consider expanding the program. UW is committed to broadening the STEM experience for undergraduates and the faculty of SMTC have proven time and again their ability to collaborate with experts in STEM to help them understand how to best teach future generations of STEM learners. Not only that, but in order for the UW STEM program to be successful, we need to create a pipeline of students who are well prepared for the rigors of college STEM classes and the SMTC staff and program have proven their ability to reach out to teachers across the state and nationally to help bolster the STEM education of our students, whether through robotics course or professional development on the Next Generation Science Standards.

I encourage you also to consider that SMTC is particularly well suited to accomplish these diverse tasks in STEM education because they are their own entity. Should SMTC be dismantled and assimilated into other sectors of STEM and education programming at UW, they will lose much of their integrity and ability to function at such a high level. Additionally, they will lose many of the connections to teachers across the state. Thanks to the great connections of SMTC, I have found my job as the Director of Education at a science museum in Casper. Without SMTC's connections, it is highly likely that I would have left the state. If you are concerned with the improvement of STEM within Wyoming, please do not eliminate the SMTC.

Thank you for your consideration.

--

~Leah Ritz
651-795-9227

Subject: SMTC Review

Date: Wednesday, December 14, 2016 at 7:42:53 PM Mountain Standard Time

From: Leah Ritz

To: Program Review - Academic Affairs Office

I submitted an earlier letter regarding my opinion that SMTC should not be eliminated, but I'd like to include a specific example of SMTC is currently supporting my work as Director of Education at The Science Zone, a hands-on science center in Casper, Wyoming. My job duties include overseeing all of the educational components of the facility. Since I started there a little over a year ago, I have asked my staff to totally revamp our curriculum. When I arrived, there was no clear curriculum and no connection to academic standards. I have been working very closely with SMTC staff to understand how to incorporate Next Generation Science Standards into our daily practices. If you are unfamiliar with NGSS, it is a massive, complicated text. SMTC is one of the only programs I know of who have done in depth work making NGSS accessible and understandable to teachers and that research has reached not only teachers in Wyoming, but all over the country. Through SMTC, I have also been able to work with a graduate student who is helping us align our curriculum with NGSS. No one on my staff has the expertise to be able to do that, and only through the time and talent of SMTC staff are we able to make our curriculum that impactful. I have interviewed multiple teachers and principals in Natrona County to find out how The Science Zone can improve our programs and their feedback is always, "align it with NGSS." Without SMTC, we would not be able to make this impact on our community.

--

~Leah Ritz

651-795-9227

Subject: SMTC Program Review

Date: Thursday, December 15, 2016 at 8:50:54 AM Mountain Standard Time

From: Teddi Hofmann

To: Program Review - Academic Affairs Office

Good morning,

I am a graduate of the SMTC NED program and had the honor of working with and being advised by Dr. Ana Houseal and Sylvia Parker. These two women are OUTSTANDING professionals in their fields. In reviewing the Proposal to Eliminate the SMTC, I have very strong concerns that Sylvia Parker could lose her employment with the closure of the center. As the K-12 Project Coordinator for the College of Engineering and Applied Science, I have had the chance to collaborate and partner with Sylvia on a frequent basis. She has provided a bridge and connection between engineering and education, particularly for our k-12 teachers in the state. Engineering is a key component of the Wyoming State Science Standards, and now, more than ever, we need professionals like Sylvia, who have the valuable skills and expertise to assist teachers in integrating engineering and science in the classroom.

Sylvia is an outstanding leader, dedicated and passionate professional, and extremely valuable education partner not only for teachers around the state but for the University of Wyoming. In your review and potential elimination of the SMTC, please consider Sylvia Parker and the outstanding work she continues to do for Wyoming. The College of Engineering and Applied Science needs partners in education, like Sylvia, to broaden our reach and impact on K-12 students and teachers in the State.

Please consider my comments in your review.

Sincerely,

Teddi Hofmann

K-14 Project Coordinator, Sr.
Engineering & Applied Science, Dean's Office
University of Wyoming
Dept. 3295; 1000 E. University Ave.
Laramie, WY 82071

Phone: 307-766-4236
thofmann@uwyo.edu

Subject: Proposed SMTC Closure Comment

Date: Thursday, December 15, 2016 at 9:00:30 AM Mountain Standard Time

From: Samuel Singer

To: Program Review - Academic Affairs Office

To Whom It May Concern:

As a professional science educator and as a graduate of the SMTC's MS program and PhD program I was dismayed to hear of the department's proposed closure. I realize that there are budget cuts that need to be made at the University. However, closing the department that is committed to advancing one of the most invaluable means of societal growth--science education--seems purely political. Given Wyoming's refusal to adopt the Next Generation Science Standards, given the removal of the facts of climate change and evolution from the State Science Standards, and given the relevant up and coming federal policies towards climate change it seems that educators need to take an even firmer stance on promoting science education, not being its detractors. Shame on the University of Wyoming.

The stated opinion that the SMTC "has been in a gradual, sustained, and marked descent in terms of its research productivity, national and state reputation and alignment of mission with the broader field of STEM education" is ridiculous. My guess is that there is no substantial evidence to support that claim. If there is, I would love to see it. Everyone whom I know holds the SMTC in the highest regards. The programs at the SMTC helped advance my career. My success is one just one data point among many that the mission of the SMTC is without a doubt in line with the broader field of STEM education.

Sincerely,

Samuel

Samuel Singer
PO Box 9584
Jackson, WY 83002
307-413-4779

Subject: Comments re: elimination of SMTC

Date: Thursday, December 15, 2016 at 10:00:21 AM Mountain Standard Time

From: Ben Johnson

To: Program Review - Academic Affairs Office

Hello,

I would like to quickly provide a few thoughts that are hopefully beneficial to the upcoming decisions being made by Academic Affairs and the Deans of their respective schools over the proposed elimination of the Science Math Teaching Center (SMTC) program.

I understand that both the Deans of the Colleges of Education and Arts & Sciences have recommended that the SMTC be eliminated, and understand the difficult budgetary decisions that will have to be made in the coming future. I respect those recommendations, yet wanted to provide a perspective from an SMTC graduate on the value of the SMTC, and the core values that should be carried forward

I would like to highlight the interdisciplinary and cross campus work that is done within the SMTC, in a world that is otherwise chock full of compartmentalization. Regardless of what decision is made on keeping/eliminating the SMTC, I feel they have utilized an extremely valuable model of collaboration that should be continued, and expanded, as the University makes next steps in the face of budget woes. The work done by SMTC, admittedly in decline, has been crucial in bridging gaps between departments and university entities, as well as providing a link for professional development with outreach to Wyoming schools, teachers, and communities. Additionally, their support of graduate students is second to none, with the ability to capitalize on relationships built with university and non-university entities across the state of Wyoming.

Thank you for your time and consideration.

Best,

Ben

Ben Johnson

(406) 381-1794

bensofbenjohnson.com

Subject: Closure of the SMTC

Date: Thursday, December 15, 2016 at 11:37:27 AM Mountain Standard Time

From: Clarissa Cole

To: Program Review - Academic Affairs Office

In May of 2016, I was able to acquire a Master's degree in teaching middle school science. I teach special education science at Evanston High School, and the education I received over a 6-year period was instrumental in helping me to be a better teacher. More important, I became part of a community of teachers from all over the state who are connected by the SMTC and its wonderful programs. It is more than an education. It is a community of people that I can share experiences with. We are linked in a very real sense. The SMTC offers many seminars and reaches out to teachers all over the state to advertise them. Frankly, I have never had any contact from the education department. But I have contacts and mail from the SMTC and its interests frequently. The SMTC has kept me informed of changes. It has enriched my teaching career in more ways than I can name. The continual outreach by the SMTC is needed by science and math teachers in this state. I believe that the University of Wyoming will go from being an outstanding school for STEM teachers to a merely mediocre one if the SMTC closes. Please keep it open for us! We need to remain connected to the University.

Clarissa K Cole

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Office of the president of the University of Wyoming,
Dr. Nichols,

I would like to express my concern about the proposed closing of the Science Math Teaching Center at the University of Wyoming. I am a retired science teacher in Lusk . I taught science and math here for 40 years and utilized the SMTC heavily during those years. I received my masters degree through the center and it became somewhat my "home away from home". The personnel and facilities of the center had a great influence on my teaching style and confidence.

I taught during several (directions, movements, innovations, changes) in science education and the staff at the SMTC were very helpful to many of us around the state in knowing what was important and how to deal with it.

The summer workshops provided much information and helped us digest it and incorporate it into our classrooms. These workshops encouraged networking with other teachers and the opportunities to share ideas and support. I made many friends there and we often shared ideas and teaching methods through the years.

The current movement in science/math education is STEM (science, technology, engineering, math). This seems to be similar what the center has been doing for all the time I have been associated with it. I hope the University will continue assisting teachers in incorporating these activities into their classrooms. It doesn't seem necessary to create a new department to do what is already able to be done.

I realize that economic times are hard for Wyoming and for the university and cuts need to happen. The SMTC has been the most important part of the University in my life and career and I very much hate to see it go away.

Dave Hamaker
Box 211
Lusk Wy. 82225
307 334 3734

December 2016

Dear UW Program Review Committee,

Please know how grateful I am for the Science and Math Teaching Center's (SMTTC) Middle Level Math program. Being a part of the Middle Level Math program is important for both my personal and professional goals.

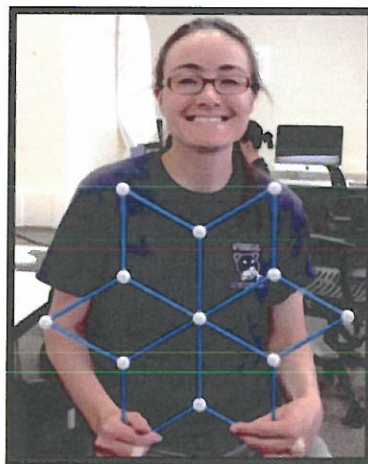
As a Science and Math teacher at Snowy Range Academy in Laramie, I feel like I am doing my life's work. I am happy to go to work every day. I am excited to teach students about new math concepts. Every day, I think about how I can implement what I have learned in my classroom. The SMTTC's teachers have inspired me to become a better teacher. Ever since I joined the program, the SMTTC's Middle Level Math program has greatly enriched my instruction and my students' education. Without the SMTTC, I would not have a job that I love and feel grateful for every day!

I have a B.S. degree in Biology and M.S. degree in Zoology, so most of my background is in science. Being in the SMTTC's Middle Level Math program has opened a whole new world for me—the world of math. After taking Dr. Ipiña's class, I have taught my students about the history of mathematicians and mathematical symbols. Dr. Ipiña has also helped me view Calculus from a totally new perspective and she inspired me to start a MATHCOUNTS program. Dr. Leonard has taught me how math can empower students. I have learned about wonderful ways to teach my students with technology in Dr. Hutchinson and Dr. Buss' Technology class.

Please know how much of a difference the SMTTC has made for me and for Wyoming students. The SMTTC understands and implements quality teacher training which impacts students' learning statewide. I strongly urge you not to cut this important program.

Sincerely,

Kristy Palmer
Laramie, Wyoming



Subject: Science and Math Teaching Center

Date: Thursday, December 15, 2016 at 11:15:51 PM Mountain Standard Time

From: Meghan Lockwood

To: Program Review - Academic Affairs Office

To whom it may concern,

My name is Meghan Lockwood and I graduated from the SMTC in Spring of 2016 with a MS in Natural Science Education. I am emailing to provide a few general facts and opinions in opposition to the elimination of the Science and Math Teaching Center.

First and foremost, the Science and Math Teaching Center provides a tight knit cohort and community for students who may be working towards their graduate degrees in a non-traditional route or program. I for example completed my first year of my Masters degree at the Teton Science Schools in Jackson, WY before continuing at UW. Many are working teachers with families and other commitments.

While I understand that the programs will simply be moved elsewhere within the University, the atmosphere and home that the SMTC provides to these students cannot be replaced. The faculty and other staff that are currently established within the department have a detailed knowledge of the many intricate paths that students in the SMTC are coming from and are working towards.

Second, the SMTC and its Natural Science concentrations provide students with a plethora of avenues to pursue once graduated. They can be public school teachers, school administrators, environmental educators, camp counselors, museum educators, zoo educators and more. The possibilities in the realm of education are widened within these programs compared to other education focused programs, and the faculty are to be thanked for that. Their combined dedication to understanding the goals and dreams of their students is truly inspiring and commendable.

Third, since the addition of a 4 credit Plan B "course" that allows students the time to be working on their Plan B theses, the ability and willingness of students to finish their projects is increasing. From my cohort, all but one have completed and passed their defenses, and the last one is continuing on to make hers a full Plan A thesis, with plans to finish this coming spring.

To imply that the SMTC is not producing enough students, degrees, or research is hard to swallow. With low numbers of faculty, there are time and resource restraints on the faculty we do have to complete their own research, as they take so much time to support graduate students with their own projects.

While this is mostly anecdotal data, I hope that the importance of the SMTC as an entity can be understood with the help of myself and other previous students. The program review states that those who experience the SMTC are fiercely loyal. This is absolutely the truth, and I know that this will be conveyed by others as well.

Thank you for your time.

Meghan Lockwood

Subject: SMTC

Date: Thursday, December 15, 2016 at 3:57:37 PM Mountain Standard Time

From: Jodi Crago-Wyllie

To: Program Review - Academic Affairs Office

December 12, 2016

Dr. Laurie Nichols, President
Dr. Kate Miller, Provost
University of Wyoming

Dear President Nichols and Provost Miller,

I am writing concerning the Dean's Program Review Memorandum of September 13, 2016 regarding the Science and Mathematics Teaching Center (SMTC). I have worked with the SMTC over the past 5 years, as our school district was awarded an MSP grant through the State of Wyoming. We partnered with the Universities, SMTC for this grant work. During this partnership, University SMTC personal, led by Dr. Ana Houseal, trained our K-5 STEM team teachers in the development of new science curriculum based on the Next Generation Science Standards (NGSS). Along with curriculum development, teams were trained in inquiry based science, science content and assessment knowledge and strategies to improve student success. The SMTC has also helped develop these teachers into science mentors for our district's K-5 teachers, creating these teacher leaders within each elementary school.

The professional development offered from the SMTC to Campbell County School District has been essential in the success of this project. We could not have done this without their knowledge and insight.

I fully support the SMTC and the work they do for the state of Wyoming. My hope is that the SMTC will be there for the needs of teachers and school districts in the near future, as the new science standards have recently been adopted and many districts are needing guidance in the process we are now finishing.

Sincerely,

Jodi Crago-Wyllie
Science Center Director/Elementary Science Facilitator
Campbell County School District
Gillette, Wyoming 82718

Subject: SMTC review

Date: Friday, December 16, 2016 at 10:22:51 AM Mountain Standard Time

From: Jeffrey R Anderson

To: Program Review - Academic Affairs Office

Review committee,

I wanted to write a short note regarding the vital support and contributions that SMTC and Sylvia Parker make to our Engineering Initiative outreach programs. We have developed and implemented a number of K12 teacher workshops, programs and presentation that are designed to bring meaningful STEM activities into the K12 classrooms throughout the State of Wyoming. The purpose of workshops is to help K12 teachers develop hands-on Arduino and Raspberry Pi activities and teaching modules that inspire students to explore and appreciate STEM technology. Although the Engineering faculty can help with the technological aspects of the workshop, it is SMTC and Sylvia that connects the technology with the K12 educational environment and requirements. Their contributions are vital to the success of the outreach efforts. This interdisciplinary collaboration on campus and with K12 teachers and schools is necessary for the success of building and supporting STEM programs throughout the State of Wyoming.

Jeffrey Anderson, Ph. D.

Subject: The Importance of the SMTC

Date: Friday, December 16, 2016 at 11:42:51 AM Mountain Standard Time

From: Anne B. Robbins

To: Program Review - Academic Affairs Office

To Whom it May Concern-

As a former student in the SMTC program, I would like to share my thoughts on the potential closure of the center. I think dismantling the SMTC would be detrimental to not only the university, but educational facilities throughout the state. Faculty and student teams that travel throughout the state share invaluable resources to help teachers improve their teaching, especially in light of the new science standards. The new science standards have been met with resistance. Luckily, the outreach teams through the SMTC have made great headway in making sure that the standards are demystified, and properly implemented. In addition to explaining content, outreach teams have shared pedagogy and methodology in the form of professional development. Teachers should not be exempt from professional development, and should be challenged to try new strategies and techniques. The SMTC provides necessary resources to support that growth.

Wyoming is in a difficult financial climate right now. Funding for educational ventures is still crucial. The SMTC has been around for several decades and therefore has a reputable name and history. Donors will be more likely to give money to a long standing program with a familiar name. If the SMTC is re-established as a P-16 STEM Education Center, it will no longer have the name recognition and background. Simply put, a new program will not have the "buying power" that the SMTC does now.

I hope that this feedback provides guidance for the immense decision that the committee must make about the SMTC. Please consider the incredible outreach work that the center provides as well as its longevity and name recognition. Feel free to contact me if you have any questions or concerns about my email.

Annie Robbins
MS in Natural Science Education
arobbin6@uwyo.edu
307-766-2325

Subject: Comment on SMTC Elimination Proposal

Date: Friday, December 16, 2016 at 12:09:16 PM Mountain Standard Time

From: Colleen Bourque

To: Program Review - Academic Affairs Office

Dear Dean Lutz and Dean Reutzel,

As and alumna of the MS in Natural Science Education (NED) program (2012) at the University of Wyoming I am writing to comment on the SMTC elimination proposal. I am in opposition to eliminating the program for a number of reasons. I would argue that the structure of the SMTC provided me as a graduate student with some of the best possible support for success. The SMTC faculty and academic professionals, most notably Sylvia Parker Ana Houseal and Kate Welsh, created a vibrant sense of community for me and my fellow classmates to succeed and gain skills for professional success. The hybrid nature of the center was useful and important to creating partnerships as well as supporting grad students.

The proposal to close the SMTC seems to be disregarding the strength of the SMTC and its years of partnerships and successes. I argue eliminating it would have more than a minimal effect on students enrolled in its programs. A disruption to one's core support structure and community as a grad student would certainly have negative impacts. Also losing the SMTC as a go-to for professional development and STEM expertise would impact so many teachers throughout the state. Rebuilding those relationships would likely be costly.

Professionally being a part of the SMTC led me to be hired in a job in my field of Place-Based Education and thanks to Ana Houseal, led me to be a published author in a peer-reviewed publication. The SMTC also prepared me to be on the cutting-edge of the latest STEM research, educational approaches, and national trends.

While I hear the need to re-imagine some aspects of the SMTC the bigger need seems to me to be in hiring a director that can lead the Center successfully. I would hope that the expertise of the staff and the excellent legacy that the center has created be taken into consideration moving forward. Sylvia Parker's expertise in particular was a cornerstone to the supportive structure the SMTC provided me during my time at UW and led directly to my success during and after the program. The SMTC does vitally important work in Wyoming and in the nation and closing it and starting over again sounds like a waste of resources and years of hard work to me.

Respectfully,

Colleen Bourque

MS Natural Science - University of Wyoming 2012

November 28, 2016

Program Review Committee
University of Wyoming

Dear Program Review Committee:

I write to express my deep concern about the pending decision to close the Science Math Teaching Center (SMTC) at the University of Wyoming. As a researcher committed to the improvement of STEM education, I have always appreciated the SMTC as a model for bringing research to practice and, indeed, have often cited the work of the SMTC as a model that can be emulated across the country. While I have not been involved with the SMTC in recent years, I have been made aware of the current situation and believe that STEM education in Wyoming will be severely compromised by the closing of the SMTC.

I first engaged with the SMTC around 1990 and was invited by then Director Vince Sindt and Pete Ellsworth to spend time in Wyoming to work on the development and implementation of new science standards. That relationship continued over the next decade, and during that time I had an opportunity to interact with teachers, school administrators, state officials, and University of Wyoming academics.

Throughout I was struck by the strong professional development community that the SMTC fostered. All the interactions I saw were characterized by deep intellectual rigor, a profound respect for and understanding of the context of teaching in Wyoming schools, and an understanding of policymaker needs and constraints. The SMTC has been able to build a deep understanding of science education that is based on trust and respect and allows for district independence while, at the same time, supporting quality education for all students in the state. It is rare, indeed, to have an academic institution be such a strong resource to educational practitioners and policymakers over such a sustained period of time.

My understanding is that there have been some more recent concerns that reflect a lack of confidence in the prior leadership. I cannot speak to those concerns, but it is my understanding that these concerns have been proactively addressed by the SMTC. What I can say is that I would be hesitant to disband an institution that has had such a prominent place in STEM education for 45 years because of short-term problems that do not appear to be foundational to the SMTC.

Certainly, it is possible to fold some functions of the SMTC into other parts of the University. However, the kinds of relationships that the SMTC has developed are not transferred via institutional reorganization. The more likely scenario is that the critical force that the SMTC has been in supporting STEM education will be lost forever as it gets folded into parts of the University where such support becomes one more agenda item rather than its *raison d'être*.

I urge you to reconsider your position and to work to ensure that the SMTC provides the same leadership and support for STEM education that it has since 1970.

Sincerely,

A handwritten signature in black ink, appearing to read "Drew H. Gitomer", with a stylized, flowing script.

Drew H. Gitomer

Subject: SMTC Comments to Proposal to Remove

Date: Friday, December 16, 2016 at 3:19:28 PM Mountain Standard Time

From: Kali Nicholas

To: Program Review - Academic Affairs Office

To Those Concerned with maintaining
quality educational opportunities at the University of Wyoming:

As a involved graduate student at the University of Wyoming in Botany and Environment and Natural Resources

(ENR), a graduate student representative for Botany, the Science Initiative (SI) and the Learning Actively Mentoring Program (LAMP), I feel I have developed an understanding of what leads to quality teaching and learning experiences. The Science and Math

Teaching Center (SMTC) provides an excellent model of how to integrate science, education and research. This program is not only wanted by numerous students, but needed across the State as an acting university outreach department, making real changes in education

programs around the state. UW should recognize this success and use and apply it in the development of new interdisciplinary programs. We should not be considering removing a model department, rather seeing where and how we can use the knowledge gained from

this department to continue breaking down silos and rebuilding a build schooling system.

Additionally, the nature of interdisciplinary graduate work should be valued and supported by the University, rather than unapproachable and unmanageable. SMTC works

toward providing this interdisciplinary opportunity, but institutional support is lacking. I hope the University uses this transition time to rework the college system, showing and giving equal value to research, education and outreach, and the bringing together

of silos. SMTC could be the outreach leg of SI, supporting K-16 and community integration.

Thank you for your time and consideration.

Sincerely,
Kali Nicholas

Kali Nicholas
knicho16@uwyo.edu
M.S. Student of Botany & ENR
University of Wyoming

Subject: Science and Math Teaching Center

Date: Friday, December 16, 2016 at 3:22:08 PM Mountain Standard Time

From: Elizabeth Horsch

To: Program Review - Academic Affairs Office

President Laurie Nichols
Dean, College of Arts and Sciences
Dean, College of Education

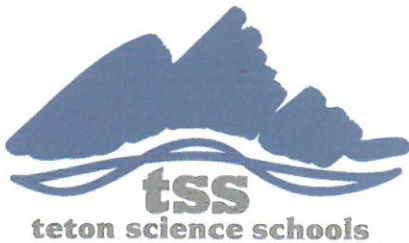
I am writing to express my opposition to the proposal to close the Science and Math Teaching Center. I have a long and productive association with the Center, first as a graduate student in 1970 when Dr. Sam Harding procured NSF funding to establish the Center, then 30 years as a Wyoming high school chemistry teacher, later as an evaluator for the Center's middle school math program, and finally as a NCSD Trustee for the past 12 years.

Over this forty plus years, the Center has served as the major bridge between Colleges of Education and Arts and Sciences and the public school science and math teachers of Wyoming. Thousands of Wyoming teachers have participated in workshops and courses offered by the Center. These courses, and the ties that have been forged with the University through these associations, have had major impact on the teaching and learning of mathematics and science in our state. Neither the College of Education nor the College of Arts and Sciences has been positioned to provide this kind of training and support.

Until recently, previous deans have had the wisdom to recognize the vital role the Center has played and have selected highly skilled administrators to guide its course. The decline in the Center's influence and productivity noted in the recent evaluation is directly linked to an abysmal failure of leadership.

If the Center is closed, the University loses a critical link to the science and math teachers in the state. At the very least, the University administration and the Colleges of Arts and Sciences and Education should be forthcoming with a plan to address this loss.

Respectfully,
Elizabeth Horsch
MS 1972
A&S Distinguished Alumnus 2000



teton science schools
EDUCATING FOR A VIBRANT WORLD

December 2016

Comments regarding the Proposal to Eliminate Academic Program Pursuant to
UW Regulation 6-43

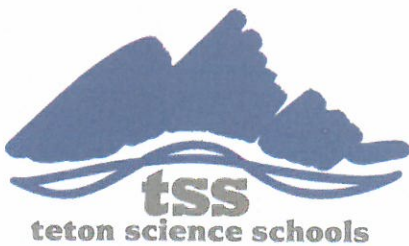
Members of the Teton Science Schools (TSS) Leadership team, Graduate Program and Teacher Learning Center (TLC) have followed with interest and some degree of concern the changes that are occurring at the University of Wyoming due to budget shortfalls. I am a representative member of the above teams. While I trust and respect the need for program and administrative efficiencies, most impactful for TSS is the elimination of the SMTC which is a current partner with Teton Science Schools Graduate Program. While this decision may already have been finalized I would like to voice my support and admiration for the SMTC, and accolade the professionalism and outstanding student and program outcomes that have resulted from our work together.

University of Wyoming has been a strong partner of TSS' Graduate Program since its inception in 1994. This practicum based graduate program provides first year graduate coursework and a teaching practicum at Teton Science Schools Kelly Campus in Jackson, Wyoming. TSS graduate students then apply those credits to partner universities for degree completion. Since 2002, the Science and Math Teaching Center and Haub School have provided excellent support and formal graduate pathways to completion. In fact, with 390 alumni of the TSS Graduate Program, almost 100 TSS graduate students have elected to complete their degree with University of Wyoming. The SMTC leadership of Pete and Judy Ellis, Bob Mayes and most recently Sylvia Parker has been pivotal to graduate success and continued strength of this partnership. They worked tirelessly in recruiting and supporting these students as they worked towards completion of their Master's degree.

Additionally, Teton Science Schools has offered professional development for teachers since the early 1970s. Since 2011, the Teacher Learning Center (TLC) of TSS has worked closely with the University of Wyoming and specifically the SMTC on a 3-year Math-Science Partnership grant - Place Learning and Civic Engagement - and then with a sub-award from the UW EPSCoR office for Wyoming Water in the Classroom and the teacher training components of the track 1 EPSCoR grant.

Our interest in partnership with the SMTC in providing teacher development through the TLC and TSS Graduate Program is due to the excellent reputation of SMTC regionally research

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teton science schools

EDUCATING FOR A VIBRANT WORLD

based, sustained, and relevant STEM professional development opportunities for pre and in service teachers throughout Wyoming.

University of Wyoming has a strong history and reputation and is in the midst of some challenging decisions. This may include the elimination of the SMTC. It is my hope as I speak on behalf of Teton Science Schools, the TSS Graduate Program and Teacher Learning Center that the necessary changes at UW does not impact the integrity of the experience for Teton Science Schools graduate students electing to complete their degree at University of Wyoming.

The vision of a STEM center that deepens and expands STEM education initiatives is exciting and I look forward to the potential partnerships that might evolve through the creation of the center.

Thank you for providing the opportunity to share comments.

Sincerely,

April Landale
Vice President for Educator Development
Teton Science Schools
Jackson, Wyoming 83001
April.landale@tetonscience.org

Connecting people, nature and place through education, science and stewardship.

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Subject: Comment on SMTC closure

Date: Friday, December 16, 2016 at 6:40:41 PM Mountain Standard Time

From: terraphiliac@gmail.com

To: Program Review - Academic Affairs Office

Hello,

I am a graduate of the UW SMTC NED program via the Teton Science School. I read through through the closure proposal and I am compelled to comment.

My experiences and education through the SMTC have given me a skill set unique among my peers in education. With guidance from the department and courses, I am able to blend best practices in inquiry based science and best practices in social justice education. After four years in public education, I assure you that few educators have the skill or awareness to mix these two essential teaching methods. To loose this opportunity from UW teacher education would diminish the professional offerings of UW and no longer set UW graduates apart.

The only way I would be in support of the closure is if there are continued academic courses in place based education, inquiry based science, and methods in social justice education. The knowledge I gained through UW SMTC program is what I rely on to maintain a positive classroom that serves all students and effectively teach science.

I am willing to provide further detail if need be.

Mandi Leigh

Sent from my iPhone

Monte C. Moses, Ph.D.
monte.moses@yahoo.com
303-720-4275

November 4, 2016

Program Review Committee
University of Wyoming
Laramie, Wyoming

Dear Program Review Committee:

I am writing to express my support for the Science and Math Teaching Center (SMTC). Over the past 35 years I have observed the work of the SMTC and witnessed the positive outcomes it has produced for K-12 teachers and students. As a result of these first-hand experiences, I believe it would be a major mistake for UW to close the SMTC.

My first experience with the SMTC occurred while I was an administrator in Casper in the early 1980s. I immediately learned that the center was the go-to organization for high quality teacher training and curriculum support in Wyoming. I so impressed that I subsequently contracted with the SMTC to provide training and support in Garland, TX., Littleton, CO., and the Cherry Creek School District in Colorado. In every case the training and curriculum development support was outstanding and fostered better teaching along with higher student performance. Each one of the aforementioned districts could have used training and resource services from a variety of providers. The SMTC was selected because of proven impact. Their content and delivery model was simply better than the others.

Most recently, I contracted the services of the SMTC while serving as the Superintendent of the Cherry Creek School District – arguably the most respected system in Colorado. During my tenure, I was honored as National Superintendent of the Year. One of the reasons for the selection was the terrific staff training and development we had in place. That model was greatly enabled by the support of the SMTC and its personnel. The teachers in Cherry Creek are very sophisticated and do not tolerate poor training. The professional development provided by SMTC met their high expectations and were always highly rated, which led to an ongoing relationship with the center.

As the current Chairman of the Colorado Commission on Higher Education, I have a deep appreciation of the pressures on higher education. Money is tight and expectations are high. And while these challenges are daunting, it does not make sense to shutter a program that has a proven track record of success and a loyal following across Wyoming, and the nation as a whole.

The program review has evidently identified some facets of the SMTC that need improvement. There is nothing unusual in such a finding – it could apply to just about every higher education department in every institution that I have observed. The answer isn't to close them, instead it is to offer support and encouragement, with accountability for improvement. In that spirit I recommend that you allow the SMTC to address the issues and set a course for the future. Given that opportunity, I am confident the SMTC would continue to be a valuable asset to UW for many years to come. Please support the continuation of the SMTC and its mission.

Sincerely,

Monte C. Moses, Ph.D.

Subject: Wyoming State Science Fair - Ideas for Funding and Placement within UW
Date: Monday, October 31, 2016 at 12:06:01 PM Mountain Daylight Time
From: Erin Ann Stoesz
To: Program Review - Academic Affairs Office, Doug Wachob, Office of the President, Douglas Ray Reutzel
CC: Anne M. Alexander
Attachments: Addendum - Wyoming State Science Fair Funding & Placement Ideas.pdf

To whom it may concern,

Thank you all for considering the information about the Wyoming State Science Fair presented to you last Wednesday. As you all know, with the proposed elimination and restructuring of the SMTC, the Wyoming State Science Fair location and funding within the University has become uncertain. I have been asked to share some ideas regarding funding and placement of the Wyoming State Science Fair. The attached document presents some of these ideas and accompanying rationale. I hope you will consider these ideas carefully in your budget, strategic planning and program elimination discussions.

General information about the Wyoming State Science Fair is available at uwyo.edu/sciencefair.

I am always happy to answer questions, and provide or find more information, and discuss other ideas.

Thank you,

Erin Stoesz

~Wyoming State Science Fair Coordinator

From: Erin Ann Stoesz
Sent: Wednesday, October 26, 2016 10:05 AM
To: Program Review - Academic Affairs Office; Doug Wachob; Office of the President; Douglas Ray Reutzel
Cc: Anne M. Alexander
Subject: Wyoming State Science Fair - Outreach Service of UW

To whom it may concern,

With the proposed elimination and restructuring of the SMTC, the Wyoming State Science Fair location and funding within the University has become uncertain. The following document (I apologize for the length) provides new data, information and ideas to support its value to the UW outreach mission. I hope you will consider this information carefully in your budget, strategic planning and program elimination discussions. Some information is provided regarding locations of science fairs within other universities, but more information is currently being collected and will be forwarded as soon as it is obtained. Some ideas for long-term funding and ideal coordinator job description are also being prepared and will be forwarded soon.

General information about the Wyoming State Science Fair is available at uwyo.edu/sciencefair.

I am always happy to answer questions and provide or find more information.

Thank you,

Erin Stoesz

~Wyoming State Science Fair Coordinator

Subject: Big picture

Date: Thursday, October 27, 2016 at 3:10:01 PM Mountain Daylight Time

From: bthakes@aol.com

To: Program Review - Academic Affairs Office

bthakes@aol.com

-----Original Message-----

From: bthakes <bthakes@aol.com>

To: Progreve <Progreve@uwyo.edu>

Cc: uwpres <uwpres@uwyo.edu>; wilmap <wilmap@uwyo.edu>

Sent: Thu, Oct 27, 2016 2:03 pm

Subject: Big picture

We are missing the big picture by considering the elimination of the Science and Math Teaching Center (SMTC) from University of Wyoming's programs. A significant priority for the State of Wyoming is economic diversification to help avert future operating budget deficits due to dwindling revenues currently dependent solely on the energy sector. This priority requires the State to be competitive through provision of a human resource pool with expertise in science, mathematics and technology. Additionally, given the current National emphasis on STEM (Science, Technology, Engineering and Mathematics) education the University, through the elimination of the SMTC, would be severely undermining not only that National priority but also one of the State of Wyoming's highest priorities. The SMTC provides education critical to the preparation of professionals currently teaching youth in Wyoming's schools in fields that significantly contribute to the diversification of Wyoming's work force and National job markets.

Barbara T. Hakes, Ph.D.
Professor Emerita
Adult Education and Instructional Technology
University of Wyoming

bthakes@aol.com

Subject: FW: Science and Math Teaching Center

Date: Saturday, October 22, 2016 at 12:48:29 PM Mountain Daylight Time

From: Kate Miller

To: Program Review - Academic Affairs Office

From: "Logue, Terrance J." <tjlogue@una.edu>

Date: Friday, October 21, 2016 at 3:39 PM

To: Office of the President <uwpres@uwyo.edu>, Kate Miller <kate.miller@uwyo.edu>

Subject: Science and Math Teaching Center

Dr. Laurie Nichols, President

Dr. Kate Miller, Provost

University of Wyoming

It is with great consternation that I learned of the possible elimination of the University of Wyoming Science and Math Teaching Center. My wife and I moved to Laramie in 1970 to attend classes at the University and I started taking graduate classes through the SMTC in 1971. The credits were for a Ph.D. in Curriculum and Instruction with an emphasis in Science Education, a program that had yet to be approved at that time. I had the opportunity to work with a number of the new elementary and secondary curriculum projects that were being introduced to the public schools. This experience resulted in a gradual change in my philosophy of science education. It also resulted in an ongoing relationship with the SMTC.

One outcome of the initial Ph.D. class was the impact two of the graduates have had on Science Education in the State of Wyoming. Dr. Bill Futrell became the Science and Math Coordinator for the State Department of Education and spent many years working with teachers throughout the state. He was well known for his energy and humor and dedication to science instruction. Dr. Joe Stephans was a Science Education Professor at the SMTC who did significant research, produced publications and worked statewide with science teachers for improvement of instruction in science. There have been many other individuals that have done graduate work and have been influenced by the instruction and philosophy of SMTC and have gone on to become leaders of local, state and national science programs.

Over the years I have attended workshops, been a member of a statewide committee on Energy Education sponsored by SMTC, taught summer classes on campus and off campus through SMTC,

taught the secondary science methods class for Joe Stephan when he was on sabbatical, and followed the activities of this institution. I know that there have been many dedicated UW faculty that understand the problems of public school teaching that have worked diligently to provide the very latest and most effective science instruction possible. In my experience faculty have always treated teachers as professionals and made classes fun and worthwhile.

I understand the problem of tight budgets, having taught geology and science education at the University of North Alabama during years of shortfalls in state money. I have some feeling for the problems at UW as my son was on the Staff Senate for a number of years which included a term as Staff Senate President. It is always a difficult job to find ways to save money. However, based on the Academic Program and Unit Review of the Science and Mathematics Teaching Center of the University of Wyoming, I find it difficult to see why this program is in danger of being cut. It seems to be a program that should receive more support if possible. The outreach programs of SMTC have affected science teachers in most of the schools of the state. Those teachers that have had good experiences will recommend graduate programs at SMTC to other science teachers. It is hard to beat a recruitment tool like that. As the new Wyoming State Science Standards go into effect, the work of the outreach of SMTC will become even more important.

The fact that one director wasn't quite in tune with the philosophy of SMTC that was developed over more than five decades, should only result in a more careful interview and hiring procedure, not in the elimination of an obviously valuable program. SMTC needs to continue to offer graduate and outreach programs to the science teacher of the State of Wyoming. When a new and better program that includes all of the valuable aspects of the SMTC has been carefully planned by the various committees that are required, and only then, should the SMTC be folded into the new program.

I would be glad to travel to Laramie for additional discussion of this important matter.

Sincerely Yours,

Terrence J. Logue, Ph.D.
Emeritus Professor of Earth Science
The University of North Alabama

tjlogue@una.edu
307-265-8887

P.O. Box 50614
Casper, WY 82605