

College of Education Dean's Office Memorandum

DATE: September 8, 2016

TO: Dr. Kate Miller, Provost

FROM: D. Ray Reutzel, Dean

RE: Technical Education Program Review – UW Casper

After reviewing the data presented in the Program Review Report forwarded to your office on June 28, 2016 and as per University regulation, I am providing you a memorandum of recommendation related to the above named degree program under review in the College of Education. The Technical Education program housed on the UW Casper campus has had a prolonged history of low productivity in number of degrees awarded annually. The Tech Ed program has no national specialized program accreditation (SPA) body but is approved by the *Wyoming Professional Standards Teaching Board* (PTSB) making the degree eligible for professional licensure in Wyoming.

The Technical Education program at UW-C is dependent upon a single faculty member and is delivered in a two-year cohort cycle. The program enjoys wide local political support but nevertheless fails to attract strong student enrollments. The Technical Education program is a rebranding of what was called years ago nationally – Industrial Arts Education. Students acquire a wide variety of vocational skills and knowledge in this program that are transferrable not only to classroom teaching but also technical career and industrial applications. Currently, 17 of the 21 or approximately 81% of graduates in the last five years are teaching in schools.

The Technical Education program aligns well with the University's outreach and service mission. This program is unique because it is offered onsite at the UW-Casper campus. It partners with Casper College that provides lower level specialized course requirements that lead to both an associate and a bachelor's degree. The cost of maintaining a Technical Education program or any Career Technical Education (CTE) centered program away from the facilities of a community college structure is cost prohibitive because of the amount of consumables, equipment, and maintenance required to provide the many diverse lab and hands-on opportunities necessary.

As a result, the direct instructional costs of this program are nearly double that of the average degree instructional cost in the College of Education. Of equal concern is the fact that the Technical Education course enrollments frequently fall below course enrollment minimums (N=10). It is also a concern that this degree program has not generated sufficient enrollments in the past and will not do so likely into the future to justify a 21-24 credit per year teaching load standard for the single Academic Professional Lecturer, Mr. Rod Thompson, who staffs the program.

Taken together, these data argue that a low demand for the technical education program at UWC is likely to continue. Many university teacher education programs have eliminated the industrial arts education degree program decades ago. Others have attempted, as we have, to rebrand this degree and modernize it. Still other universities have re-envisioned with the help of the K-12 community to offer an engineering technology education degree in conjunction with colleges of education and engineering. It should be noted that eliminating this degree program would effectively eliminate in a key vocational education program in the K-12 schools at a time when Wyoming is trying to diversify its economy. Consequently, we can anticipate significant political, WDE, and K-12 community resistance from some school district superintendents and local legislators.

My recommendation initially was to consolidate the Technical Education program at UW, Casper campus and the UW, Laramie campus-based Agriculture Education degree into a single degree program. However, upon closer examination, UW Laramie is ill equipped to provide the facilities to support the Technical Education program. Similarly, UW, at Casper is ill equipped to provide access to the labs and agricultural coursework needed in agricultural education. In essence there would be little of "combining" except in a few courses, but the degree programs and campuses would remain essentially separated into two distinct programs.

Furthermore, the state of Wyoming has an alternative route for providing CTE educational courses in Wyoming high schools. Individuals who have taken necessary coursework and have industrial or other career related experience and expertise in CTE fields might be employed to teach under a *Trade and Technical Profession Industry Career permit*. Consequently, after serious deliberation, it is my recommendation that the Technical Education degree program be eliminated due to persistent low productivity. As difficult as this decision is, it has been one that has been decided at many of UW's peer and aspirational institutions.

DRR

Academic Program Review
Report Template
University of Wyoming
Office of Academic Affairs
March 2016
Submitted June 26, 2016

(adapted from SDSU)

Deans and Directors who administer an authorized major or course of study approved by action of the Board of Trustees will be responsible for conducting program reviews. Four key elements should be addressed in each academic program review: (1) Program Demand, (2) Program Quality, (3) Mission Centrality, and (4) Cost.

For each program that is reviewed, a recommendation will be made by the Academic Dean to the Vice President of Academic Affairs.

Title of Program/Specialization: Technical Education

Indicate whether undergraduate or graduate program/specialization: Undergraduate

Department and College: Secondary Education, College of Education

Department Head Name and contact information (phone, email): Dr. Kate Muir Welsh
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Part 1 – Program Review

1. Program Demand:

Technical Education is a Bachelor's Degree program only and is offered on a two- year cohort cycle. It does not meet the cut-off for the number of graduates over a five-year period. Listed below is a list of the graduates from the previous four Technical Education cohort cycles. Some cycles, because of the need to complete lower level content, a student will take a class after residency in order to complete the needed content for program completion.

2016	4 graduates (anticipated)
2014	4 graduates
2012	10 graduates
2010	7 graduates
2008	5 graduates

2. Program Quality: Is the program of high quality?

a. Program accreditation

1. Wyoming Professional Teaching Standards Board (PTSB) is the agency responsible for licensure and endorsement of the Technical Education graduates.
2. The most recent PTSB accreditation was completed and approved in September 2013.
3. The program will follow the accreditation cycle of the College of Education national accreditation which will occur again in seven years (2023).

4. While completing the most recent program accreditation process in 2013 by the PTSB, there were two concerns raised, addressed and discussed. When final accreditation occurred, there were no outstanding recommendation or conditions. The following were the concerns and the written responses to the PTSB board.

Concern 1). Use maintenance and assessment of products and systems utilized in trade and technical education, including safety. *In response to the first concern, a course titled EDSE 3020 Facilities and Advisory Management was further explained. In this course, students work with an advisory committee as well as classroom teachers from both junior and senior high schools. Students complete a safety observation of the classrooms and labs and then visit with the classroom teachers about suggestions and questions they have about the layout. Students also participate in maintenance and minor repairs expected from a classroom teacher. They are provided the opportunity to exchange welding tanks, test the gauges, and replace saw blades and cutter heads. Students have the opportunity to work alongside classroom teachers to perform the tasks required on a daily basis of a full time teacher. Once the PTSB heard more about what was in place, they felt that the concerns they had were actually met in the program course.*

Concern 2). Knowledge of various trade and technical systems including but not limited to: (A) medical biotechnologies, (B) agriculture, (C) energy and power, (D) information and communication, (E) transportation, (F) manufacturing, (G) construction, (H) technical and graphic design, animation and (I) technological systems.

In response to the second concern, students are provided many opportunities to be ready for positions within the region. Placing resident students in situations where they are only working in one area such as welding or woods does not provide a well-rounded opportunity. Students need to be aware of as many teaching strategies as possible and need to be well-rounded and capable at a beginning level to teach any area deemed to be Technical Education. Students who have had residency in locations such as Buffalo and Wright as well as those who have been placed in Casper are very comfortable with not only teaching multiple classes but also find comfort in teaching multiple classes within a single block of time. Though they felt the program's rationale was strong enough to satisfy their needs. Mr. Thompson finds it difficult with the credit hour mandates to be able to prepare students for all of the areas PTSB felt were needed.

b. Credentials of faculty

- i. Faculty Name: Mr. Rodrick Thompson, M.A. Education, University of Northern Iowa
- ii. Ethnicity: Caucasian; Gender: Male
- iii. Grants Awarded: As a part of EDSE 3020 Facilities and Advisory Management course, students write and apply for grants. They do this in conjunction with their residency placement mentor so that the equipment can be housed in the schools and used by the mentors once the resident student has completed and graduated from the Technical Education Program. Grant applications are submitted to the Natrona County Board of Cooperative Educational Services (BOCES) primarily because of its willingness to allow students to appear and discuss the grant face-to-face with their entire board. In the past five years, following are some of the grants that have been awarded:
2016
Mark Forge 3-D printer and 3-D doodle pens \$13,000.
(Equipment is at Frontier Middle School.)
2015
CNC Plasma CAM \$17,000
(Equipment is housed and maintained in the Robotics Lab at Casper College.)
2013
Sawstop table saw \$4,000
(Equipment is in the Design Studio at Casper College.)
2011
CNC wood E Z Router with Enroute software \$35,000
(Equipment and software is at Natrona County High School, Casper.)
2011
Pneumatic bend tester for welding tests. \$3,500 (Equipment is housed at Kelly Walsh High School, Casper.)
2011
Laguna re-saw Band saw \$6,000
(Equipment is housed and maintained at Kelly Walsh High School, Casper.)
- iv. Grants submitted by Mr. Thompson: Applied for University of Wyoming Math and Science Partnership grant in each of the following years (2011, 2012, 2013). Grants were not funded.
- v. Presentations: Presented every summer at the Wyoming Association for Career and Technical Education in the Technology Education division meetings.
- vi. National/International Awards: In 2014, Mr. Thompson was recognized as a Distinguished Technology Educator (DTE) by the International Technology Engineering Educators' Association (ITEEA)

c. Program reputation

- i. There are few Technical Education programs nationally, especially in the western United States. There are constant inquiries for the graduates of the program from administrators and human resources personnel desperately searching for qualified Technical Education graduates for the openings within their respective school districts. Locally, Natrona County School District #1 is

opening a Pathways Innovation Center, where students from area high schools travel to a separate district complex to attend a high-end pathway capstone courses in a concentrated area of study. Of the three teachers selected to be the capstone instructors in the technical areas of the Architecture, Construction, Manufacturing and Engineering (ACME) Pathway, all are former graduates of the UW-Casper Technical Education Degree.

The UW-C Technical Education program and students are recognized around the nation. Students participate in regional competitions in both Colorado at the Colorado Technology Educators Association annual conference and Missouri at the International STEM Educator's Conference as well as national competitions. Students consistently place in the top three places in regional and national competitions. The competitions that the UW-Casper students compete are the Quiz Bowl which is a Jeopardy-style challenge where schools face off in live competition in teams of four. The questions are technology and engineering-based as well as pedagogy. The UW-Casper team is consistently in the top of the competing teams. Another competition that UW-Casper students excel is in Teaching a Lesson competition. UW-Casper TEECA has had a competitor place first or second for the past three years and third in the past five years. UW-Casper TEECA typically places within the top five in the Problem Solving Challenge. These are competitions that are sponsored and held at both the regional and national completion sites. Only the Teaching a Lesson Challenge has a pre-conference qualification activity. The other challenges are open to each student chapter that is attending the conference.

d. Curriculum of major or specialization

- i. UW-Casper Technical Education students enter the program as juniors who have completed an associate's degree from Casper College. The Associate's degree in Technical Education includes specialized areas of concentration in the areas of Automotive, Communication, Drafting, Electronic, Manufacturing, Welding and Woodworking. These areas align with high-need skills throughout our region. Once at UW-Casper, the students complete the following laboratory based courses in a two-year rotation (listed below). Once completed the Technical Education Bachelor's degree leads to certification to teach in the state of Wyoming by the Wyoming Professional Teaching Standards Board.

<u>YEAR ONE:</u>	<u>Fall courses in even years:</u>
EDSE 3010	Contemporary Philosophies of Technical Education (3 credits)
EDSE 3030	Construction Technology (3)
EDSE 3610	Manufacturing Technology (4)

<u>YEAR ONE:</u>	<u>Spring courses in odd years:</u>
EDSE 3040	Energy and Power Technology (3)
EDSE 3050	Communications Technology (3)

<u>YEAR TWO:</u>	<u>Fall courses in odd years:</u>
EDSE 3020	Facilities and Advisory Management (3)
EDSE 3277	Technical Education Methods I (3)
EDSE 4277	Technical Education Methods II (4)
<u>YEAR TWO:</u>	<u>Spring Student Teaching Residency in even years:</u>
EDSE 4500	Residency in Teaching (15)

Changes to the Program: In Fall 2013 the program shifted to create the two-year rotation listed above to implement a cohort model. This shift happened to increase enrollment. In Fall 2016, the program will begin additional curriculum changes that will affect the lower level courses provided in the Associate's Degree delivered at Casper College. In an attempt to keep up with technological changes and to provide the students with the best program while making the credit hours achievable, Casper College instructors, division and academic deans have met to approve a newly formatted Technical Education Associate's Degree for students completing that degree in conjunction with the UW-C Technical Education Bachelor's Degree.

- e. Distance delivery of program/major
 - i. Technical Education is an on-site program offered only at UW-Casper.
- f. Quality of Assessment Plan/data
 - i. Program assessment follows the process of all programs within Wyoming Teacher Education Program (WTEP). All Secondary Education Department programs have Tier 1 status on UW assessment of student learning in the WTEP programs, student teaching evaluations, as well as common assessments to determine student abilities. It also uses the recommendations of the Technical Education Advisory Committee. The committee identifies areas of strength or concern with the UW-Casper Technical Education program and its ability to teach and prepare secondary students for their next steps as teachers. Since the most recent accreditation in 2013, the program also implemented the Praxis Test # 0051 with a cut score of 159 for showing competence in Technical Education. The Praxis exam requirement will start in Fall 2016. There is close collaboration, conversation and identification with the Casper College Technical program instructors to ensure that the graduates are prepared for the classroom expectations on the technical skills of robotics, electronics, drafting and design, welding, and woodworking as well as the additive and subtractive processes of manufacturing.
- g. Strategic Plan
 - N/A- There is not a current UW strategic plan to demonstrate connections.
- h. Other: The Technical Education students are actively involved with local, regional and national association activities. As part of the national Technology Education Engineering Collegiate Association (TEECA), students compete regionally and nationally. Mr. Thompson had national champions in competitions such as Teaching a Lesson, and Technology Challenge (quiz bowl type competition) as well as national

student officers representing national TEECA. Locally, UW-C TEECA, is a recognized student organization at Casper College, hosts a Technology Student Association (TSA) Day at the college. Over 150 middle school students attend a one-day professional development and competition day each spring. Students also, as part of a community service expectation, spend time in Title I elementary schools within Natrona County completing STEM activities.

3. Mission Centrality: Does the program advance the mission of UW including institutional strategy?

- a. The Technical Education program aligns well with the mission of the University in the respect to UW's commitment to outreach and service. Having a location in Casper, UW extends its capacity to serve more students in all communities throughout the state and provides a university presence away from Laramie. The mission states there is an understanding that the greatest service is to provide the state and nation with teachers. This is also recognized as one of the mission's guiding principles when it comes to serving the needs of the state.
- b. The program being housed in Casper does not have an impact on programs across the Laramie campus. The students though are served by other UW College of Education faculty housed in Casper so the Technical Education student numbers do affect the course enrollments in EDST 3000 and EDST 3550, both courses taught onsite at the UW-C campus.
- c. Of the 21 students who have graduated in the 2010, 2012 and 2014 cohorts, 17 of the 21 or approximately 81% of them are currently working and teaching in schools. Only two of those are teaching out of state, one in Kansas and the other in South Dakota.

Of those four graduates not teaching, one has retired, one works in natural resources (family is involved in oil, one returned to construction (owner of Mountain Man Construction), one is and has been traveling through Europe.

- d. This program is unique because it is offered and only taught onsite on the UW-Casper campus. Another uniqueness of the Technical Education program is working with Casper College to provide the lower level academics as well as the content needed to develop students into highly qualified Technical Education teachers. There is a clear, articulated, and agreed upon 2+2 plan for students to achieve the Bachelor's degree. The students are provided the opportunity to learn on state-of-the-art welding, machining, robotic, CNC, and design-based equipment and software all maintained and managed through Casper College. These students, though they are degree seeking, are not degree seeking in each of the high level content areas for which they are taught. The cost of trying to maintain teacher certification in all of the areas that are taught by Casper College would be a huge expense of time and money. To maintain an American Welding Society (AWS) certified instructor and the welding equipment needed for even the simple flat horizontal welding procedures for basic certification would cost more in consumables, not counting the welding units,

themselves than the entire budget for the UW-C Technical Education program. The Technical Education students are provided the needed instruction, time on machines and the consumables needed to be proficient, right alongside students from the college who are becoming industry certified and working throughout the region as welders. The cost of maintaining a Technical Education program or any CTE centered program away from the community college structure would be cost prohibitive because of the amount of consumables, equipment, and maintenance required to provide so many diverse opportunities.

e. None

4. **Cost: Is the program financially viable?**

Mr. Thompson's 2015-16 salary is \$67,908. Benefits are not included in the calculations below.

In 2015-16, Mr. Thompson taught the following five courses

Semester	Course #	Credits	# of Students	Total student credit hours
Fall 2015	EDSE 3020-Facilities and Advisory Management	3	4	12
	EDSE 3277- Technical Education Methods I	3	5	15
	EDSE 4277- Technical Education Methods II	3	5	15
Spring 2016	EDSE 3540- Teaching Reading in the Content Area	2	20	40
	EDSE 4500- Student Teaching Residency (Faculty act as supervisors for 10 students. <ul style="list-style-type: none"> Students enroll for 15-16 credit hours. The faculty receive 5 credits in their teaching load for EDSE 4500.) 	5	10	50
		Totals	44	132

a. Ratio of student credit hours per FTE: **132 student credit hours: 1 faculty**

b. Direct instructional expenditures:

i. **Per student credit hour: \$ 514.45** per student credit hour

ii. **Per total degrees awarded: \$16,977** per degree

(In 2013-14, four degrees were awarded. In 2015-16, four degrees are anticipated to be awarded.)

iii. **Non-personnel expenditures per total academic FTE: UW, Laramie= \$0**
UW, Casper=\$0.

(UW-C receives \$11,700/year from the Natrona County BOCES board to support the Technical Education program for course supplies, instructor and

student travel, promotional items, etc.)

- c. Course enrollment
 - i. Number of classes falling under university minimums.
Fall 2010- Spring 2016: **21 out of 40** courses in Mr. Thompson's teaching load fall below UW's 10 students per course minimum.
 - ii. Lower-division courses falling under university minimums: **0**
(There are no 1000 or 2000 lower division undergraduate courses in this program.)
- d. Other instructional cost drivers, such as:
 - i. Section fill rates: Only one section of each Technical Education course is offered per semester.
 - ii. Course completion rates: 90-100% completion rate depending on the cohort.
 - iii. Curricular complexity: All of the courses in the Technical Education program are laboratory based. The courses incorporate knowledge and skills to prepare future Technical Education teachers.
 - iv. Faculty course load: Only one faculty in program. As an APL, Mr. Thompson teaches on average 17 credit hours per year.
- e. Research expenditures per tenured/tenure-track FTE (and other academic personnel, where appropriate): **\$0**
(Mr. Thompson's job description does not contain research.)
- f. Compare your data to national benchmarks (Delaware data): No comparative national data are available in Technical Education. (Per UW's Office of Institutional Analysis.)
- g. Other: N/A

Part II - Recommendations

Instructions: *After the review is completed, the Dean in consultation with the Department Head will select one of the following recommendations. In the justification, address each of the items associated with the recommendation.*

4) Consolidate with Program(s) between Colleges/campuses (e.g., UW/C)

- a) UW's Technical Education Program is unique in the mountain west. Building from a strong collaboration with Casper College, the program provides the state of Wyoming future teachers. By eliminating the program UW will effectively be crippling the K-12 system from providing important and needed vocational education that citizens in an era when Wyoming is trying to diversify its economy are desperately needed. UW pulling back the Technical Education program is ill advised. Therefore, we recommend that Technical Education at UW, Casper campus and Agriculture Education on the UW, Laramie campus be consolidated. The collaboration will also include Casper College.
- b) Justification for retaining due to cross-campus consolidation must include:
 - i) Explanation for how the consolidated programs will collaborate (e.g., sharing of required courses, shared faculty, etc.) to maintain graduate production thresholds:

Technical Education and Agricultural Education have inherent overlap in some of the skills needed to teach effectively such as welding and mechanics. With these two programs combined we expect that graduate production thresholds will be reached.
 - ii) Evidence that multi-campus collaboration will meet graduate production thresholds, or specific steps to increase enrollment if merging programs fails to meet production thresholds:

Both Technical Education and Agricultural Education fields are in need of certified teachers. At the UW Center for Advising and Career Services' job fairs and through email contact, school districts ask if we have teacher candidates available. Secondary Education will work with UW admissions and the UW Foundation to develop recruitment strategies.
 - iii) Preliminary outcomes of collaboration between campuses.

The faculty associated with Agriculture Education on the UW, Laramie campus (Dr. Chris Haynes) and Technical Education at UW, Casper campus (Mr. Rod Thompson) met to discuss initial collaboration. They have established a google doc to upload the two program plans and identify where overlap exists. Upon completion of this activity, they will meet formally with Office of Teacher Education staff Todd Krieger and Christi Thompson to start in the process of a new program plan development for a combined program. Also we will work with UW initiatives (Education, Engineering, and Science) to investigate how to support and grow Technical and Agricultural education programs. Additionally, we will partner with the Wyoming Department of Education's Career and Technical Education section to better articulate between K-12 education and the University of Wyoming.

APPENDIX A

“Low Productivity” Programs Excluded from Review Process

- 1) **Major Program Modifications**
 - a) Degree programs that have undergone recent program modifications that adversely impact graduate production for a college.
 - b) Modifications traditionally include programs that have undergone recent name changes during the reporting window that result in two equivalent degree programs.
- 2) **Program/Major Specializations**
 - a) Degree programs that have one or more specializations which reduce the total number of graduates.
 - b) The exclusion may apply only for those specializations where the combination results in graduate production that meets the established threshold for the degree.
- 3) **Terminated Programs**
 - a) Degree programs that have been inactivated during the reporting period, but still depict graduates that fall below the established thresholds.
 - b) Terminated programs will remain on the Program Productivity Report until inactive programs have completely cycled through the established reporting period.
- 4) **New Programs**
 - a) Degree programs that have been activated within the past 7 years resulting in limited graduate production due to program implementation.
 - b) Institutional review may be requested prior to the 7th year if graduate production is not scaling to the required thresholds for the degree level.