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Identifying Perceived Professional Development Needs of Idaho Secondary CTE Teachers: Program Management Needs of Skilled and Technical Science Teachers

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Abstract

The purpose of this study was to examine the perceived training needs of Idaho secondary skilled and technical science teachers for a set of non-instructional competencies specifically associated with duties related to program management. The population of this study consisted of skilled and technical science teachers employed by Idaho secondary schools for the 2008-09 academic year (N=181). Sixty percent (n=109) of the 181 teachers participated in the study. The findings indicated that the perceived in-service training areas for the program management construct, as identified by a mean weighted discrepancy score (MWDS) ranking, to be grant writing and funding opportunities, developing curriculum-based school-to-work and/or school-to-career activities, and establishing and organizing co-op/internships. Individuals involved with teacher preparation and in-service training can use the findings of this study to inform the development of pre-service curriculum and in-service educational offerings.

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Introduction

Career and technical education (CTE) teachers must stay current with the best professional practices and content area industry needs. Wash, Lovedahl, and Paige (2000) argued that for beneficial change to occur in the classroom, "…teachers need access to information concerning current practices and trends" (p. 45). According to Boser and Daugherty (1994), advancing the educational profession forward requires providing teachers with "…updated information on curriculum, methodology, and technology to allow them to make philosophical and programmatic changes that augment technology education" (p. 4). Greenan, Mustapha, Wu, and Ncube (1998) identified factors that motivate vocational teachers to improve their programs as – "…caring for students, concern for professional growth, and a desire to keep programs current with changing technologies" (p. 11). Joerger (2002) emphasized the need for appropriate and timely pre-service and in-service activities for CTE teachers to ensure that they are properly equipped to contend with changing conditions in CTE education. Lambeth, Elliot, and Joerger (2008) identified professional development of teachers as part of the national CTE research agenda. While researchers can agree that appropriate pre-service and in-service training must be provided to teachers, it is much more difficult to identify the training that is most appropriate and most needed. This study sought to identify Idaho's skilled and technical science teachers' perceived professional development needs as they pertain to program management.

Conceptual Framework

As the nature of the global economy changes, secondary skilled and technical science teachers face the

challenge of providing learning experiences that prepare their students to enter the work force or to pursue additional educational opportunities. Aligned with industry, curriculum areas for skilled and technical science include automotive repair, building construction, cabinetry and furniture making, electronics technology, information systems technology, media technologies, and small engine repair. In order to prepare students for the needs of industry, skilled and technical science teachers must continually work to stay in the forefront of good teaching practices in regard to pedagogy and technology. They must also have the skills and knowledge necessary to manage their programs. To meet this demand, these teachers need annual in-service training opportunities from both educational institutions and industry. It is through in-service training that skilled and technical science teachers expand their knowledge and improve their pedagogical and program management skills.

The professional development of teachers is an important aspect of the national CTE research agenda (Lambeth, Elliot, & Joerger, 2008). In-service opportunities are often orchestrated by teacher educators and state career and technical education staff to meet the needs of teachers (Barrick, Ladewig, & Hedges, 1983). One proven method of identifying CTE pre-service and in-service needs utilizes a descriptive survey based on the Borich Needs Assessment Model (Dobbins & Camp, 2000; Garton & Chung, 1996; Joerger, 2002; Layfield & Dobbins, 2002; Ricketts, Duncan, & Peake, 2006). Most researchers use a modified version of the Borich model to evaluate the "perceived level of importance" and "perceived level of competence" of teachers pertaining to professional competencies identified by research and related to the issues of their respective states. In 1997, Garton and Chung used a modified version of the Borich Needs Assessment Model and a quadrant analysis to survey the in-service needs of beginning agriculture teachers.

While Garton and Chung (1997) utilized a quadrant analysis, Edwards and Briers (1999) sought to compare the ranking of in-service needs based on a mean weighted discrepancy score (MWDS), i.e., the Borich model. Consequently, they determined that the discrepancy method, like the Borich model or a version of it, is more effective than a direct assessment. Edwards and Briers' finding informed the decision to use an instrument modeled after the Borich Needs Assessment Model to achieve the purposes of this study.

Previous professional development needs assessment research has been conducted primarily on beginning teachers and in agricultural education (Duncan, Ricketts, Peake, & Uesseler, 2006; Edwards & Briers, 1999; Garton & Chung, 1996, 1997; Heath, Dimock, Adams, & Zuhn, 1999; Joerger, 2002; Layfield & Dobbins, 2002; Mundt & Connors, 1999). Garton and Chung (1996 & 1997) found completing reports for local/state administrators, motivating students to learn, preparing FFA degree applications, and developing an effective public relations program to be the in-service constructs with the highest needs among beginning agricultural instructors. Mundt and Connors (1999) found classroom management/student discipline, time/organizational management, and managing the activities of the FFA chapter to be constructs beginning agricultural teachers identified as the most pressing challenges. Edwards and Briers (1999) found the highest ranked in-service needs to be assisting students in preparing for and succeeding in FFA degree and award programs; using the Internet as a teaching tool; balancing quality time among different life roles such as teacher, spouse, or parent; and using support groups to publicize the program. Maintaining the usefulness of an advisory committee; utilizing an advisory committee to promote the local agriculture and FFA programs; the ability to use the local advisory committee to acquire resources to sustain the local program chapter; and

utilizing advisory committee members as resources for classroom, laboratory, SAE, and FFA activities were identified by Joerger (2002) as the highest in-service needs in his study of beginning agricultural education teachers.

Several agricultural education studies have sought to determine the in-service needs of experienced as well as beginning teachers. Layfield and Dobbins (2002) identified using computers in classroom teaching; preparing FFA degree applications; preparing FFA proficiency award applications; using multimedia equipment in teaching; and teaching recordkeeping skills as the most important in-service needs. They also identified the most important in-service needs of beginning agricultural education teachers to be utilizing a local advisory committee; developing local adult education programs; organizing fund-raising activities for the local FFA chapter; preparing agricultural/FFA contest teams; and developing supervised agricultural educational opportunities for students (Layfield & Dobbins, 2002). Duncan, Ricketts, Peake, and Uesseler (2006) identified the program management in-service needs of agricultural education teachers as being: the need for assistance with advising students who have an interest in post-secondary education, preparing various FFA applications, and developing an effective public relations program.

Few studies have been conducted to determine teacher in-service needs in CTE content areas other than agricultural education. Heath-Camp and Camp (1990) identified three areas of difficulty for beginning teachers: system-related problems such as inadequate orientation, equipment, and supplies; student-related problems such as lack of motivation and undesirable behavior; and personal struggles with self-confidence, time management, and organizational skills. Lu and Miller (2002) compared instructional technology in-service needs of teachers from Ohio with their counterparts in Taiwan

whose highest rated needs were protecting computers from viruses and effectively using desktop video conferencing and tele-teaching technologies for distance learning (Lu & Miller, 2002).

Purpose and Objectives

The purpose of this study was to determine Idaho's skilled and technical science teachers' perceived levels of importance and competence as they relate to specific competencies, both for beginning and veteran teachers, and use that information to determine the perceived pre-service and in-service needs of this population. More specifically, the following objectives guided this study:

1. Determine the demographic characteristics and educational background of Idaho skilled and technical science teachers;
2. Describe Idaho skilled and technical science teachers' perceived importance of specific areas of program management;
3. Describe Idaho skilled and technical science teachers' perceived competence in specific areas of program management; and
4. Determine perceived professional development needs of Idaho skilled and technical science teachers in the specific area of program management.

Procedures

This study is part of a larger project investigating the perceived professional development needs of Idaho CTE teachers. Results have been separated by program area and construct categories. Specifically, this portion of the project focused on skilled and technical science teachers' perceived

program management in-service needs. Program areas other than skilled and technical sciences were business and marketing, family and consumer sciences, health occupations, and technology education. The construct categories determined through a review of published research were teaching and learning and program management (Duncan, Peake, Rickets, & Uesseler, 2006).

A descriptive research design with a survey method was used. Data was collected from skilled and technical science teachers employed in a rural northwest state which described their perceived level of importance and competence across a variety of program management tasks and duties. Skilled and technical science encompasses the following content areas: automated manufacturing, automotive technology, building construction, cabinet and furniture making, collision repair, computer aided design (drafting), diesel technology, electronics technology, environmental science, home technology integration, industrial mechanics, law enforcement, masonry, media technology, precision machining, small engine repair, and welding.

The 59-item survey instrument was developed and adapted from previous research on agricultural teachers by Duncan, Peake, Rickets, and Uesseler (2006). The 2006 Duncan et al. instrument was a modified version of the *Minnesota Beginning Agricultural Education Teacher In-service Programming Needs Assessment* (Joerger, 2002). The Joerger (2002) instrument was modeled after Garton and Chung's (1996) instrument which was based on the Borich Needs Assessment Model (Borich, 1980). Twenty-four of the items were specific to program management (Table 1).

Table 1

Program Management Survey Items
Grant writing and funding opportunities
Career Clusters and Programs of Study / Pathways
Completing reports for local and state agencies
Conducting an adult program
Conducting needs assessments to determine Programs of Study / Pathways
Conducting parent/teacher conferences
Coordinating activities with local organizations/agencies
Determining CTE program content for specific courses
Develop and maintain required safety standards (State and Federal/OSHA standards)
Developing an effective public relations program
Developing curriculum-based School-to-Work and/or School-to-Career activities
Developing relations with fellow teachers and administrators
Establishing and using a program advisory committee
Establishing and organizing co-op/internships
Evaluating a CTE program
Fundraising for Career-Technical Student Organizations
Identifying appropriate course textbooks, references, and materials
Integrating CTSO activities into the regular classroom
Issues involved with traveling with students
Planning and conducting student field trips
Program related trends and current issues
Providing guidance and career exploration activities to students
Recruiting/promoting student involvement with CTSOs
Understanding federal (Perkins), state, and local funding

A panel of experts; consisting of faculty from the University of Idaho, University of Georgia, an Arizona CTE teacher, and four Idaho pre-service CTE teachers; evaluated the instrument for face, content, and construct validity. The reliability of the instrument was assessed through an analysis of the collected data. Reliability coefficient alphas were calculated for the items on both "Importance" ratings (α = .915) and "Competence" ratings (α = .917). The results indicated an instrument with a high degree of internal consistency. The data collected from this process, along with further review and analysis by the panel of experts, refined the instrument into its final form.

Idaho is a rural state which ranks nationally in the top 15 for land area, but in the bottom 15 for population. Agriculture and natural resources comprise the largest portion of the state's economy. However, leading corporations that manufacture technology such as Hewlett Packard and Micron Technology have operations in the most densely populated part of the state. Due to the state's expanse and remoteness, Idaho's educational system faces challenges regarding the quality of opportunities for all students. Examples of these challenges are providing a quality teacher for every classroom and providing students with access to technological advances.

The population for this study consisted of skilled and technical science teachers employed in Idaho for the 2008-09 school year (N=181). The instrument was administered to the population in May and June of 2009 through an online survey using procedures suggested by Dillman (2007). An initial invitation to participate was sent via e-mail to skilled and technical science teachers identified by the Idaho Division of Professional-Technical Education. Follow-up prompts for participation were delivered at two and four week intervals. In all, 109 (60.2%) skilled and technical science teachers completed the survey instrument.

Collected data were analyzed using Excel™ and the Statistical Package for the Social Sciences (SPSS) software. The importance and competence scores were used to calculate the teacher preparation and in-service needs by calculating a mean weighted discrepancy score (MWDS) for each item. The MWDS score was calculated by subtracting the competency score from the importance score, multiplying that number by the mean importance rating of the item, and then calculating the average of these values across cases (Borich, 1980; Joerger, 2002).

Non-response bias was of concern and examined by the researchers. Analysis of non-response bias is important in determining if a sample is representative of the population from which it was drawn. Miller and Smith (1983) determined that non-respondents are similar to those late in responding to surveys. In a review of research literature spanning ten years, Lindner, Murphy, and Briers (2001) concluded that "both early/late comparison and follow-up with non-respondents are defensible and generally accepted procedures for handling non-response error as a threat to external validity of research findings" (p. 51). Radhakrishna and Doamekpor (2008) indicated that if no significant difference is found between early and late respondents, then the findings from the sample may be representative of the population. For this study, non-response bias was evaluated by comparing the average importance and competence ratings between early respondents ($n = 56$) to late respondents ($n = 16$) through the use of an independent samples t-test. No statistically significant difference was found in the importance ratings between early respondents ($M = 3.99$, $SD = .57$) and late respondents ($M = 4.18$, $SD = .59$) ($t(70) = -1.112$, $p > .05$). The results of the independent samples t-test comparing competence ratings between early responders ($M = 3.46$, $SD = .66$) and late responders ($M = 3.64$, $SD = .49$) found no statistical difference

between groups ($t(70) = -1.048$, $p > .05$). Based on these findings, the sample data was determined to be representative of the population from which it was drawn.

Findings

Objective One: *Determine the demographic characteristics and educational background of Idaho skilled and technical science teachers*

As indicated in Table 2, almost half of the skilled and technical science teachers who responded were from the traditional trade and industry content area ($n = 53$, $f = 48.6$). Close to a quarter of the respondents identified themselves in the trade and industry media content area ($n = 26$, $f = 23.9$), and another quarter identified themselves in the trade and industry information systems content area ($n = 26$, $f = 23.9$). Teachers who identified themselves as being in the trades and industry electronics group had the lowest number of respondents ($n = 4$, $f = 3.6$). The vast majority of respondents were male ($n = 87$, $f = 79.8$) and married ($n = 89$, $f = 81.7$). Teachers age 45 to 54 ($n = 33$, $f = 30.3$) and 55 to 64 ($n = 33$, $f = 30.3$) made up the largest age groups, with the same number of teachers in each. The 35 to 44 group was the next largest age group ($n = 27$, $f = 24.8$). Most of the respondents either had a high school diploma ($n = 36$, $f = 33.0$) or a master's degree ($n = 36$, $f = 33.0$). Teaching experience was diverse. Teachers with 11 to 20 years of experience represented the largest category ($n = 31$, $f = 28.4$). A large majority of teachers received training through the Idaho occupational certification process ($n = 81$, $f = 74.3$), while a little more than 50% of the teachers received teacher training through a traditional undergraduate degree program ($n = 56$, $f = 51.4$). It should be

noted that teachers were given the opportunity to indicate more than one method of teacher training.

Table 2
Demographic Characteristics of Idaho Skilled and Technical Science Teachers

		n	%
Content Area:	Trade and Industry Traditional	53	48.6
	Trade and Industry Media	26	23.9
	Trade and Industry Information Systems	26	23.9
	Trade and Industry Electronics	4	3.6
	All Groups	109	100
Gender:	Female	22	20.2
	Male	87	79.8
Married Status:	Married	89	81.7
	Single	18	16.5
	Not Indicated	2	1.8
Age	<= 25	1	0.9
	25 to 34	13	11.9
	35 to 44	27	24.8
	45 to 54	33	30.3
	55 to 64	33	30.3
	>= 65	2	1.8
Education	High School Diploma	36	33.0
	2-year (Associate)	4	3.7

	4-year (Bachelor)	2	1.8
	Masters degree	36	33.0
	Specialist	4	3.7
	Doctorate	2	1.8
Teaching Experience	0 (just completed teacher training)	1	0.9
	1-2 years	17	15.6
	3-5 years	19	17.4
	6-10	23	21.1
	11-20	31	28.4
	>= 20	17	15.6
	Not Indicated	1	0.9
Training[1]	Traditional Undergraduate University Program	56	51.4
	Graduate Certification beyond Bachelors degree	31	28.4
	Combined Undergraduate and Graduate Program	27	24.8
	Substitute Teaching Leading to Full-time Teaching Position	5	4.6
	Occupational Certification (work experience plus course work)	81	74.3
	Alternative Certification (ABCTE[2], Peace Corps, etc.)	3	2.8
	No Formal Teacher Training	20	18.3

Note. Trade and Industry Traditional includes: automated manufacturing, automotive technology, building construction, cabinet and furniture making, collision repair, computer aided design (drafting), diesel technology, environmental science, home technology integration, industrial mechanics, law

enforcement, masonry, precision machining, small engine repair, and welding.

[1]Survey allowed participants to select all the listed options they felt applied, thus, overall total count exceeds participation count.

[2]American Board for Certification of Teacher Excellence.

Objective Two: Identify Idaho skilled and technical science teachers' perceived importance of specific areas of program management

Teachers were asked to rate 24 program management competency statements using the following response scale: Not Important (*M* = 1.0-1.49), Of Little Importance (*M* = 1.5-2.49), Somewhat Important (*M* = 2.5-3.49), Important (*M* = 3.5-4.49), and Very Important (*M* = 4.5-5.0). As reported in Table 3, Idaho skilled and technical science teachers viewed no competencies as "very important," 23 competencies as "important," and one competency (conducting an adult program) as "somewhat important". The top five competencies with the highest means were "Providing guidance and career exploration activities to students" (*M* = 4.42, *SD* = 0.69), "Developing relations with fellow teachers and administrators" (*M* = 4.42, *SD* = 0.73), "Develop and maintain required safety standards (State and Federal/OSHA standards)" (*M* = 4.32, *SD* = 1.04), "Identifying appropriate course textbooks, references, and materials" (*M* = 4.31, *SD* = 0.79), and "Program related trends & current issues" (*M* = 4.30, *SD* = 0.69).

Table 3

Importance Ratings of Program Management Construct Items for Skilled and Technical Science Teachers (n=109)

Topic	*M* [1]	*SD*
Providing guidance and career exploration activities to students	4.42	0.69
Developing relations with fellow teachers and administrators	4.42	0.73
Develop and maintain required safety standards (State and Federal/OSHA standards)	4.32	1.04
Identifying appropriate course textbooks, references, and materials	4.31	0.79
Program related trends and current issues	4.30	0.69
Determining PTE program content for specific courses	4.19	0.88
Evaluating a PTE program	4.17	0.86
Establishing and using a program advisory committee	4.16	0.92
Grant writing and funding opportunities	4.16	1.00
Developing an effective public relations program	4.16	1.02
Developing curriculum-based School-to-Work and/or School-to-Career activities	4.14	0.92
Understanding federal (Perkins), state, and local funding	4.11	0.89
Coordinating activities with local organizations/agencies	4.06	0.95
Establishing and organizing co-op/internships	4.03	0.89
Conducting parent/teacher conferences	3.94	1.13
Issues involved with traveling with students	3.88	1.13

Recruiting/promoting student involvement with PTSOs	3.83	1.09
Planning and conducting student field trips	3.69	1.01
Conducting needs assessments to determine Programs of Study / Pathways	3.63	1.08
Completing reports for local and state agencies	3.62	1.25
Career Clusters & Programs of Study / Pathways	3.60	1.05
Integrating CTSO activities into the regular classroom	3.60	1.12
Fundraising for CTSOs	3.57	1.19
Conducting an adult program	2.93	1.30

[1]Response Scale of 1=Not Important, 2=Little Importance, 3=Somewhat Important, 4=Important, 5=Very Important.

Objective Three: Identify Idaho skilled and technical science teachers' perceived competence in specific areas of program management

Teachers were asked to rate the same 24 program management competency statements using the following response scale: Not Competent (*M* = 1.0-1.49), Little Competence (*M* = 1.5-2.49), Somewhat Competent (*M* = 2.5-3.49), Competent (*M* = 3.5-4.49), and Very Competent (*M* = 4.5-5.0). As reported in Table 4, teachers perceived that they were "competent" in 11 of the 24 statements, and "somewhat competent" in the remaining 13 statements. The five highest perceived competence ratings were "Developing relations with fellow teachers and administrators" (*M* = 4.09, *SD* = 0.80), "Identifying appropriate course textbooks, references, and materials" (*M* = 3.93, *SD* = 0.87), "Conducting parent/teacher conferences" (*M* = 3.92, *SD* = 1.04), "Determining PTE program content for specific courses" (*M* = 3.88, *SD* = 0.81),

and “Develop and maintain required safety standards (State and Federal/OSHA standards)” (*M* = 3.85, *SD* = 1.06).

Table 4

Perceived Competence Ratings of Program Management Construct Items for Skilled and Technical Science Teachers (n=109)

Topic	*M* [1]	*SD*
Developing relations with fellow teachers and administrators	4.09	0.80
Identifying appropriate course textbooks, references, and materials	3.93	0.87
Conducting parent/teacher conference	3.92	1.04
Determining PTE program content for specific courses	3.88	0.81
Develop and maintain required safety standards (State and Federal/OSHA standards)	3.85	1.06
Providing guidance and career exploration activities to students	3.74	0.90
Establishing and using a program advisory committee	3.71	1.09
Evaluating a PTE program	3.71	0.90
Planning and conducting student field trips	3.68	1.04
Program related trends and current issues	3.67	0.88
Completing reports for local and state agencies	3.54	1.13
Career Clusters and Programs of Study / Pathways	3.46	0.90
Coordinating activities with local organizations/agencies	3.44	1.05

Developing an effective public relations program	3.40	1.07
Understanding federal (Perkins), state, and local funding	3.38	1.09
Issues involved with traveling with students	3.36	1.18
Recruiting/promoting student involvement with PTSOs	3.34	1.12
Developing curriculum-based School-to-Work and/or School-to-Career activities	3.31	1.24
Conducting needs assessments to determine Programs of Study / Pathways	3.23	0.95
Conducting an adult program	3.22	1.26
Integrating CTSO activities into the regular classroom	3.21	1.14
Establishing and organizing co-op/internships	3.20	1.13
Fundraising for CTSOs	3.03	1.22
Grant writing and funding opportunities	2.99	1.20

[1]Response Scale of 1=Not Competent, 2=Little Competence, 3=Somewhat Competent, 4=Competent, 5=Very Competent.

Objective Four: Determine perceived professional needs of Idaho skilled and technical science teachers in the specific area of program management

In-service need is represented by the mean weighted discrepancy score (MWDS) as reported in Table 5. The highest rated program management in-service training need was “Grant writing and funding” (MWDS = 4.85), followed by “Developing curriculum-based School-to-Work and/or School-to-Career activities” (MWDS = 3.44), “Establishing and organizing co-op/internships” (MWDS = 3.32), “Developing an effective public relations program” (MWDS = 3.16), and

"Providing guidance & career exploration activities to students" (MWDS = 3.04) respectively.

Table 5

Program Management Priority Areas for Professional Development of Idaho Secondary Skilled and Technical Science Educators

Topic	Rank	MWDS [1]
Grant writing and funding opportunities	1	4.85
Developing curriculum-based School-to-Work and/or School-to-Career activities	2	3.44
Establishing and organizing co-op/internships	3	3.32
Developing an effective public relations program	4	3.16
Providing guidance & career exploration activities to students	5	3.04
Understanding federal (Perkins), state, and local funding	6	3.01
Program related trends and current issues	7	2.77
Coordinating activities with local organizations/agencies	8	2.52
Develop and maintain required safety standards (State and Federal/OSHA standards)	9	2.00
Issues involved with traveling with students	10	1.96
Fundraising for CTSOs	11	1.95
Establishing and using a program advisory committee	12	1.92
Recruiting/promoting student	12	1.92

involvement with PTSOs		
Evaluating a PTE program	14	1.89
Identifying appropriate course textbooks, references, and materials	15	1.72
Developing relations with fellow teachers and administrators	16	1.44
Conducting needs assessments to determine Programs of Study / Pathways	15	1.41
Integrating CTSO activities into the regular classroom	18	1.40
Determining PTE program content for specific courses	19	1.31
Career Clusters and Programs of Study / Pathways	20	0.54
Completing reports for local and state agencies	21	0.30
Conducting parent/teacher conferences	22	0.11
Planning and conducting student field trips	23	0.03
Conducting an adult program	24	-0.75

[1]Mean Weighted Discrepancy Score.

Conclusions, Discussion, and Recommendations

This study is part of a larger project to identify perceived professional development needs of Idaho career and technical education teachers. Specifically, this study sought to determine the perceived in-service needs for skilled and technical science teachers for the program management construct. Perceived needs may be different from actual needs. Teachers may perceive that an item is not an in-service need, whereas others in the profession such as state administrators or university teacher educators could arrive at a different

conclusion. Because of the difference between perceived and actual needs; Idaho CTE staff, university teacher education faculty, teachers, and others involved with professional development planning might consider the use of this as part of the overall decision-making process.

Other states might consider using this study as a guide in determining teacher in-service needs. However; CTE administrators, university teacher educators, and other education professionals should take into account the nature of Idaho and its educational system. As stated earlier, Idaho is a rural state with a sparse population which is centered around the largest city and state capital. The economy of the state revolves around agriculture and natural resources; however there is significant employment in technology manufacturing. These factors need to be taken into consideration by other state CTE stakeholders as they evaluate the findings of this study.

The purpose of this study was to determine the perceived program management professional development needs of Idaho skilled and technical science teachers using a modified version of the Borich Needs Assessment Model adapted from previous research in agricultural education (Duncan et al., 2006; Garton & Chung, 1996; Joerger, 2002). Previous agricultural education researchers have identified completing administrative reports, preparing FFA degrees and awards applications, utilizing advisory committees, developing effective public relation programs, and advising students who have an interest in post-secondary education as perceived program management in-service needs by teachers (Duncan et al. 2006; Joerger, 2002; Layfield & Dobbins, 2002; Edwards & Briers, 1999; Mundt & Connors, 1999; Garton & Chung, 1997).

Utilizing the mean weighted discrepancy score, this study found that grant writing and funding opportunities were determined to be the overwhelming perceived professional

development need. It is difficult to compare this finding with previous research due to the different disciplines being studied and the significantly different economic climate facing the United States. Because of the economic slowdown, Idaho educational programs, and specifically skilled and technical science programs, have faced declining financial support from the public funding sources. This phenomenon is not unique to Idaho and reflects national trends in educational funding. The findings of this study make it clear that skilled and technical science teachers have an interest in pursuing funding sources other than the status quo. By providing professional development activities that provide teachers with the skills and knowledge necessary to identify and secure financial resources, teacher educators and state CTE staff can help to ensure vibrant and effective programs that meet the needs of the students they serve. It should be noted that the ability and effectiveness of meeting this in-service need might be negatively affected by budget reductions cuts at teacher preparation institutions and by the state CTE division.

A perceived need for training related to grant writing and funding opportunities should raise concerns about the viability and sustainability of CTE programming through the public school system. Since the Smith-Hughes Act of 1917, CTE has been supported through public funding at the federal level. This funding has been continued by recent legislation such as the Perkins Act (Phipps, Osborne, Dyer, & Ball, 2008). Historically, Idaho has also financially supported CTE programs. The CTE profession should be concerned with future funding trends related to the viability and sustainability of programs and curriculum. Teachers should be applauded for having an interest in securing supporting funds for their programs; however, if implemented, this effort would probably reduce instruction and curricular development activities.

Three of the top five perceived in-service needs were related to program curriculum development: developing curriculum-based school-to-work and/or school-to-career activities, establishing and organizing co-op/internships, and providing guidance and career exploration activities to students. Teachers understand the importance of providing students with opportunities that will prepare them to successfully enter the workforce. In this age, it is of the utmost importance to provide teachers with the resources necessary to effectively prepare students to meet global employment demands.

An interesting demographic finding of this study was the high percentage of teachers whose highest level of education was a high school diploma. One of the aspects of the *No Child Left Behind Act* is the requirement of a highly qualified teacher in every classroom (NCLB, 2002). In some states and some content areas, qualification for the highly qualified classification requires at the minimum, a bachelor's degree (Smith & Gorard, 2007). Idaho provides an advanced certification for skilled and technical science teachers who have completed a degree in teacher education; however, teachers are not required to obtain this level of certification to maintain a teaching credential (Idaho Department of Education, 2006). Many Idaho public schools place teachers with degrees at a higher salary level than those without degrees. One could infer from this finding that a significant number of skilled and technical science teachers, who as a part of professional development plans, might benefit from courses that lead to the completion of an associate's degree, at a minimum. Future research should be conducted to determine the most effective and efficient methods to meet this in-service need.

Review of pertinent research literature failed to discover studies using similar methodology outside of agricultural education in the CTE content areas, and it is

difficult to compare the results of this study with the in-service needs of skilled and technical science (trades and industry) teachers in other parts of the United States. Because of the lack of program management in-service needs research in CTE content areas outside of agricultural education, the methodology of this study may serve as a guide for other researchers in the profession and the findings used for comparison. In summary, the following are specific recommendations from this study:

1. Teacher educators, state CTE staff, teachers, and other educational professionals with a stake in Idaho skilled and technical science should use the results of this study as a guide in the development of future professional development activities;
2. Researchers in other states should use this study as a guide to determine the perceived in-service needs of skilled and technical science (trades and industry) teachers in their respective states and regions;
3. Researchers in CTE should use this study, and similar studies from agricultural education based on the Borich model, to conduct thorough professional development needs assessments across all content areas of CTE;
4. Researchers should use the results of this study as a guide to determine the specific content of professional development activities in order to meet the perceived in-service needs;
5. Follow-up evaluations should be conducted in order to determine the effectiveness of any implemented professional development activities to meet the perceived in-service needs;
6. CTE staff, teacher educators, teachers, and educational professionals with a stake in Idaho CTE

programming, should develop a timeframe to conduct future in-service needs assessment; and

7. Researchers should determine whether a need exists to provide the appropriate courses and professional development activities in order to provide teachers with an opportunity to obtain a college degree.

The professional development of CTE teachers has been identified as an important priority of the national CTE research agenda (Lambeth et al., 2008). The findings of this study are informative to those involved with the preparation and professional development of skilled and technical science teachers in Idaho, and serve to contribute to the identification of national trends concerning the professional development activities perceived as important by in-service skilled and technical science teachers.

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