# *The Journal of Vocational Education Research*

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Printed by the Ohio State University, Columbus, OH

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**Volume 27, Issue 3 2002**



The *Journal of Vocational Education Research (JVER)* is published three times a year in April, August, and December and is an official publication of the American Vocational Education Research Association (*AVERA*). *AVERA* was organized in 1966 to (a) stimulate research and development activities related to vocational education, (b) stimulate the development of training programs designed to prepare persons for vocational education research, (c) foster a cooperative effort in research and development activities with the total program of vocational education, other areas of education and other disciplines, and (d) facilitate the dissemination of research findings and diffusion of knowledge.

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# Editor's Note

**Jay W. Rojewski**
*University of Georgia*

This issue of the Journal of Vocational Education Research (*JVER*) represents the third and final issue of volume series 27. And, I am pleased to report that the backlogged 2002 volume series has been completed. The *JVER* is "back on track" in terms of publication schedule and in timely reviews of submitted manuscripts. A special thanks to all of those people—*JVER* Board, *AVERA* Executive Board, manuscript reviews, and the new *JVER* Editor Joe Kotrlik—who have graciously contributed their time and talents to re-establishing the JVER as a reliable and timely publication. Finally, I appreciate the opportunity to serve in the capacity of Interim Editor, but now turn publication responsibilities over to Dr. Kotrlik. I am confident that the *JVER* will flourish under his leadership.

The five articles in this issue represent the dissertation work of recent graduates of career and technical education doctoral programs. Each of these authors presented their work during a special session of the *AVERA* program at the Association of Career and Technical Education (ACTE) conference held last December in Las Vegas, NV. If these studies are representative of doctoral-level research in graduates programs around the country, the future of research in workforce education and development appears positive. The topics of these current studies reflect a diverse range of interests from the influence of financial aid on postsecondary program completion to comparing international banking programs in the U.S. and Germany, stress experienced by novice teachers in Ohio to perceived teacher competencies in U.S. and Taiwanese vocational teachers to influences on teacher efficacy. Research designs, methods, and analyses are equally diverse and represent both quantitative and qualitative paradigms.

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# Attrition, Completion, and Graduation Rates in Georgia Technical Colleges Before and After the Initiation of the HOPE Grant

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## Abstract

*Two groups of students enrolled in Georgia technical college diploma programs were studied: one group matriculated in fall 1992 (n=9,463) and a second group matriculated in fall 1997 (n=12,467). Z–scores and logistic regression were used to determine differences and relationships in attrition, completion, and graduation rates before and after the initiation of the HOPE (Helping Outstanding Students Educationally) scholarship program. Attrition and completion rates were greater after the initiation of the HOPE grant, while the graduation rate was less. The attrition and completion rates were also higher for students who received the HOPE grant compared to students who received need-based financial aid. Logistic regression analysis illustrated that students were less likely to leave school in 1992 than in 1997, and part-time students were more likely to be completers than full-time students. Students were less likely to be completers in 1992, but more likely to graduate in 1992 than in 1997. When controlling statistically for all independent variables, 50% of the change in attrition rates and 37% of the change in decreasing graduation rates occurred after the initiation of HOPE in 1997.*

The study of student attrition in postsecondary education takes on much importance as colleges work to retain students. Attrition is defined as students who quit attending school prior to completing requirements for graduation from a diploma program. In studies of attrition at the 2-year postsecondary level, distinctions are made between program completion and graduation. Students completing at least 50% of a recognized program of study and then gaining employment in the field of study are considered completers, although they have not graduated from any particular program (Council on Occupational Education, 2000).

Historically, approximately one-half of all traditional freshmen entering college ultimately graduate. Conversely, the attrition rate for nontraditional students in two-year colleges is close to 60% (Lombard, 1992). In fact, of the three million students who enrolled in two-year postsecondary institutions in 1995-96, after three years, 36% did not earn a degree or certificate and were no longer enrolled in school, 6% did not earn a degree but were still enrolled in school, and 58% had attained a degree or certificate after three years (Berkner, Carroll, Clune, & Horn, 2000). Kerka (1995) speculated that attrition rates have increased because students

in colleges and universities are increasing at more widely varying stages of the life cycle compared to the traditional 18- to 22- year old cohort.

While attrition is a problem, colleges have struggled in their attempts to gather good information on attrition, and without such data are hampered in efforts to launch successful retention programs. According to Tinto (1987), most college students leave voluntarily, and their decisions to withdraw stem most often from personal, social, or financial problems. Barton (1997) suggested that to make higher education obtainable there are several critical issues to be examined including the formulations for financial aid, non-completion rates at postsecondary institutions, and improving graduation rates in high schools. College Board Online (1996) described four distinct factors influencing student attrition: student experience factors, finances, cost and external factors, and institutional variations. Financial aid lowers the net cost of attendance and increases the probability of persistence. Roslund (1998) completed a study of 600 non-returning students from Davenport College Career Center and found that financial aid problems were the number one reason for not returning. It appears there is a direct relationship between financial aid concerns and student retention.

According to DeSalvatore and Hughes (2000), for the third year in a row in 1999-2000 year, Georgia ranked number one for students receiving state financial aid to attend postsecondary education. In fact, their national survey found that 77.9% of Georgia's undergraduate students received state-financed grants and scholarships to attend Georgia public and private colleges and universities during the 1998-1999 academic year. Georgia's high ranking is attributed to the Helping Outstanding Pupils Educationally (HOPE) Scholarship program funded by the Georgia Lottery for Education. HOPE became available in September 1993 to all qualified Georgia citizens. For the first seven years, 556,030 students received more than one billion dollars in scholarships to pay for tuition, fees, and books (Georgia Student Finance Commission, 2000a). Among Georgia's 33 public technical colleges, 243,000 students received HOPE scholarships with total awards in excess of $21 million between September 1, 1993, and December 9, 2000.

Of the 64,539 students in 2-year postsecondary technical colleges who received financial aid during the fall 2000 academic quarter, 46,532 received HOPE Scholarship or Grant funds, 16,639 received Pell Grant funds, 1,673 received funds through Veterans Administration, and 1,008 received funds through the Job Training Partnership Act. During this same quarter, 5,847 students were enrolled in developmental studies for English/reading and 6,706 in developmental studies for math (Georgia Department of Technical and Adult Education, 2000a).

According to Georgia's HOPE Scholarship Program Regulations for the 2000-2001 academic year (Georgia Student Finance Commission, 2000b), non-traditional students, GED recipients, recent high school graduates, and home-study students are eligible to receive a HOPE grant to cover tuition, HOPE-approved mandatory fees, and a book allowance to seek a technical diploma or certificate at a

public 2-year postsecondary institution in Georgia if specific requirements are met. All individuals who have been legal residents of Georgia for at least one year, regardless of grade average or high school graduation date, may be eligible for a HOPE Grant. Selective service registration is required for all males over the age of 18. Students must not be in default of a student loan and must be free of drug convictions for 90 days in order to qualify for HOPE Grant funds. In order to retain the HOPE grant funds at technical colleges, students must make satisfactory progress toward earning a diploma or certificate. According to the Georgia Student Finance Commission (2000b), graduates from 91 high schools had a 40% or better renewal rate for the HOPE scholarship. This means that approximately 60% of the high school graduates eligible in one academic year were no longer eligible for HOPE funds the following year.

Variables of interest in attrition studies include full-time and part-time status, entry-level education, financial aid plans, age, gender, ethnicity, and types of programs of study. Tinto (1982) suggested developing group-specific models of student disengagement to include gender, race, age, and social status backgrounds. Metzner and Bean (1987) proposed that dropout decisions for nontraditional students are based both singularly and interactively on six constructs which include background and defining variables, academic variables, environmental variables, psychological outcomes, academic outcomes, and intent to leave. Catt (1998) found that the obstacles most likely to inhibit student persistence were loneliness, financial issues, housing problems, security concerns, and the inability to commit to the college or local community. Horton (1998) included prerequisite requirements for courses, student age and enrollment status at the time the courses were taken, ACT subscores and composite scores, type of high school diploma, type of high school attended, and gender as variables in his study of student attrition. Pardee (1992) conducted a study at a medium-sized California community college and concluded that (a) the typical returning student was a white female between the ages of 28 and 32, taking less than six units during the evening and working in excess of 40 hours per week, (b) 30% of the students had been out of school for 5 years or longer, 23.7% for one year, and 10% for two or three years, (c) desire to learn was the most important influence to return to college for both men and women and for all ethnicities, except black students, (d) other significant influences were improved earning potential, increased value on education, improved emotional outlook, occupation requires, and dissatisfaction with job, (e) the six top-ranked influences corresponded closely to the top-ranked *trigger influences* that were identified before a student drops out of school, and (f) 73% of students were returning to the college they had left originally. Nippert (2000) concluded that women are somewhat more likely to complete their degrees than men and academic activities, college GPA, and choosing to re-enroll had a positive effect on educational attainment.

## Purpose of Study

*Problem and Purpose Statement*

Financial aid issues are a major problem for students and the most common reasons students give when dropping out of school. A large percentage (72% in fall 2000) of students at Georgia's technical colleges utilize HOPE scholarship and Grant funds (Georgia Department of Technical and Adult Education, 2000a). HOPE funds are being spent with little or no documentation of the impact they have on educational attainment. Therefore, this study investigated the relationship of the HOPE Grant to student attrition, completion, and graduation from diploma programs at Georgia technical colleges.

The purpose of this causal-comparative study was to determine the attrition, completion, and graduation rates of students in Georgia technical college diploma programs (less than 90 quarter credits) before and after the initiation of the HOPE grant in 1993 and to explain the relationship between selected dependent and independent variables. The HOPE grant was initiated in September 1993, therefore two groups of students were included: one group matriculated in 1992, the year before the initiation of the HOPE grant program; a second group matriculated in 1997, five years after the initiation of the HOPE grant program. We compared the dependent (response) variables—attrition, completion, and graduation rates of students—based on the independent (explanatory) variables—(a) full-time and part-time enrollment status, (b) age, (c) gender, (d) ethnicity, (e) program divisions, and (f) need-based financial aid. Attrition, completion, and graduation rates of students who received Pell Grant and/or JTPA funds (need-based financial aid) were compared with students who received only HOPE grant funds.

*Research Questions*

The following research questions were addressed:

1. Is there a significant difference in attrition, completion, and graduation rates in Georgia technical colleges before and after the initiation of the HOPE grant based on (a) full-time and part-time enrollment status, (b) age, (c) gender, (d) ethnicity, or (e) program division?

2. Is there a significant difference in attrition, completion, and graduation rates in Georgia technical colleges between those students who received the HOPE grant and those students who received need-based financial aid?

3. What are the strengths of relationships between the dependent variables—attrition, completion, and graduation—and the independent variables—full-time and part-time enrollment status, age, gender, ethnicity, and program division?

4. Controlling for all independent variables—full-time and part-time enrollment status, age, gender, ethnicity, and program division—what is the relationship of the initiation of the HOPE grant and attrition, completion, and graduation rates?

## Theoretical Framework

The framework for this study was based on theories of student attrition from St. John (1991, 1992), Tinto (1993), and Bean and Metzner (1985). St. John (1991) reported that evidence existed from econometric studies concluding that student financial aid was an effective means of promoting equal opportunity and in promoting persistence in higher education. St. John reported that some studies found that financial aid was effective, while others concluded it had no significance. Because of conflicting findings, St. John (1992) recommended two models for evaluating the effects of financial aid, which he referred to as the Basic Attendance Model and Workable Persistence Model. These models used existing institutional data sources. The Basic Attendance Model includes social background (gender, age, ethnicity, dependency status, financial need), academic preparation (test scores, high school, some college), student aid (any aid, grants, loans, loans and work, grants, work, all other types of aid, amounts), and attendance. The Workable Persistence Model includes all of the parts of the Basic Attendance Model plus academic experience (grades and programs of study) and college experiences (special programs and extracurricular activities).

According to Tinto (1987), most traditional college students leave voluntarily and their decisions to withdraw stem most often from personal, social, and financial problems. Tinto (1982) suggested developing group-specific models of student disengagement to include gender, race, age, and social status background. Models of attrition that include descriptions/levels of social and academic interactions without including gender, race, age, and social status tend to underestimate and even distort the characteristics of dropouts among various groups of students, especially those from disadvantaged backgrounds. Tinto (1988) suggested that students are more likely to be successful in college if they go through *rites of passage* that include separation from past associations, transition that begins when the person begins to interact with members of the new group, and the last phase, incorporation. Incorporation is the taking on of new patterns of interaction with members of the new group and establishing competent membership in that group as a participant member.

Tinto (1993) revisited his theories on student attrition, particularly as they related to traditional and nontraditional students at two-year and four-year, public and private institutions. His major emphasis was that student attrition is most affected by a lack of social and academic integration with the community. The community is described as the school, faculty, and students.

Bean and Metzner (1985) developed a model of student attrition that states that older students (nontraditional) drop out of school because of one or more of the following variables: (a) academic performance, (b) intent to leave, (c) previous performance and educational goals, and (d) environmental variables. Environmental variables (e.g., finances, hours of employment, outside encouragement, family responsibilities, opportunity to transfer) have a greater

impact on decisions of adult students to leave than academic variables (study habits, academic advising, absenteeism, major certainty, course availability). The Bean-Metzner model suggests that making environmental factors conducive to completion could compensate for weak academic support. Metzner and Bean (1987) proposed that dropout decisions for nontraditional students are based both singularly and interactively on six constructs which include background and defining variables, academic variables, environmental variables, psychological outcomes, academic outcomes, and intent to leave. In contrast with Tinto's expectations, the social integration variable was not found to have significant effect on nontraditional student attrition. The Bean and Metzner model indicated that the most significant variables influencing dropout decisions for nontraditional students are academic performance, intent to leave, background and defining variables, high school performance, educational goals, and environmental variables.

## Method

*Population and Sample*

The population for this study was students who were enrolled in diploma programs (less than 90 quarter credits) at Georgia's technical colleges during the fall 1992 and fall 1997 academic quarters. The 33 technical colleges and 17 satellite campuses in the state of Georgia are units of the Georgia Department of Technical and Adult Education (GDTAE). In fiscal year 1992, 53,302 students were enrolled in credit courses at Georgia technical institutes; during fall quarter, 19,018 were full-time students and 12,845 were part-time students. In fiscal year 1997, 76,300 students were enrolled in credit courses at Georgia technical institutes; during fall quarter, 21,715 were full-time students and 25,889 were part-time students (Department Technical and Adult Education, 2000). Student data were limited to those enrolled in diploma programs requiring less than 90 quarter credits for the program of study. Full-time students normally complete diploma programs requiring between 60-90 quarter credits of course work in four quarters. During fall 1992, 12,486 students were enrolled in diploma programs with less than 90 quarter credits in the program of study. During fall 1997, 15,840 students were enrolled in diploma programs with less than 90 quarter credits in the program of study. These two groups of students served as the population for the study. If a student did not have an exit status such as graduate, completer, or leaver recorded in their file, they were excluded. The remaining number of students in fall 1992 was 9,593 and fall 1997 was 12,734. The data files were further reviewed with incomplete records excluded. The number of eligible students to be selected in the sample for research questions 1, 2, and 3 was 9,463 students in fall 1992 and 12,467 students in fall 1997. For research questions, 4, 5, and 6 only the 12,467 students in fall 1997 were included. Of the 12,467 students, 4,667 students received need-based financial aid, 5,879 students received HOPE funding, and 1,921 students received no financial aid. For research questions 7, 8, 9, and 10, the number of eligible students in the sample included all 21,930 students.

Diploma programs were categorized into six divisions by the GDTAE: (a) agricultural/natural resource technologies, (b) business technologies, (c) engineering science technologies, (d) health technologies, (e) industrial technologies, and (f) personal/public service technologies. No students from the engineering science technologies division were included because programs in this division contain more than 90 quarter credits in the program of study.

Data was acquired from information available in BANNER, a computer software program used as a student management system by all public Georgia technical colleges. Biannually, the director of student services at each college reviews and updates students' records in the BANNER system to denote whether a student is a leaver, completer, or a graduate from a program. Students who quit attending school prior to completing requirements for graduation from a diploma program are considered a leaver. Those who return to school after being in non-attendance for one quarter are not counted as leavers. Students completing at least 50% of the program of study and then gaining employment in the field of study (Council on Occupational Education, 2000) are designated as completers. Only students who completed all courses in the diploma program and met all other graduation requirements were considered graduates.

Full-time and part-time students enrolled in fall 1992 were tracked until fall 1994, while students enrolled in fall 1997 were tracked until fall 1999 to allow sufficient time for students to complete their programs of study. Full-time students were enrolled in 12 credits of course work or more, part-time students were enrolled in fewer than 12 credits or course work. The query from BANNER provided data to establish exit status (leaver, completer, or graduate) for fall 1994 for each student enrolled in diploma programs in fall 1992 and for fall 1999 for each student enrolled in diploma programs in fall 1997. The data were used to determine if a significant difference existed in attrition, completion and graduation rates before and after the initiation of the HOPE grant based on full-time and part-time enrollment status. For remaining BANNER queries, full-time and part-time students were considered as one group. The next query provided data to establish exit status based on age, gender, ethnicity, and program divisions for each student in fall 1994 for the students enrolled in diploma programs in fall 1992 and for each student in fall 1999 for students enrolled in diploma programs in fall 1997. For this study, need-based financial aid was determined by whether students had received a Pell Grant or JTPA funds. The next BANNER query provided data that designated exit status (leaver, completer, or graduate) for students who had received Pell Grant or JTPA and HOPE Grant funds for each student in fall 1999 for students enrolled in diploma programs (with less than 90 quarter credits) in fall 1997. Students who received Pell Grant or JTPA funds were compared with students who received only HOPE Grant funds. The data was input into SAS for analysis.

*Data Analysis*

Analyses using z–scores and logistic regression were used to determine differences in attrition, completion, and graduation rates before and after the initiation of the HOPE grant. A z–score is a standard score frequently used in educational research that is derived from standard deviation units. Also, z–scores are continuous and have equality units. Thus, a person's relative standing on two or more measurements can be compared by converting the raw scores to z–scores (Gall, Borg, & Gall, 1996; Huck, 2000). The z–distribution is used when samples are large and is used to determine the level of statistical significance of an observed difference between the groups. Logistic regression deals with the relationship among variables where one variable is the dependent variable, while the other(s) is/are independent variables. The independent variable can be continuous or categorical. In this study, all independent variables are categorical.

The purpose of logistic regression can be either prediction or explanation (Huck, 2000). Logistic regression revolves around a core concept called the odds ratio. The odds ratio measures the strength of association between an independent variable and dependent variable. A subset of independent variables in a typical logistic regression is referred to as control variables. Such variables are included to assess the relationship between dependent and independent variables. The primary focus is on non-control independent variables, with the goal being to identify the extent to which each one plays a role in explaining why changes exist with the dependent variable. Most researchers utilize logistic regression so they can discuss the explanatory power of each independent variable using the concept of odds. By using the estimates in logistic regression, researchers also try to find a good set or model of independent variables that can help predict or explain group membership on the dependent variable.

The dependent variables in this study were attrition, completion, and graduation rates of students at Georgia technical colleges before and after the initiation of the HOPE grant. The nominal independent variables were: (a) full-time and part-time enrollment status, (b) age, (c) gender, (d) ethnicity, (e) program divisions, and (f) financial need to describe each student enrolled in diploma programs in fall 1992 and fall 1997. Age categories were consistent with those used in BANNER data collection from GDTAE. Ethnic categories from the initial query included American Indian, Asian, Black, Hispanic, White, non-resident alien, and multi-racial. For analytic purposes, I recoded the ethnic designation into White ($n$=6406 for fall 1992, $n$=7428 for fall 1997), Black ($n$=2809 for fall 1992, $n$=4552 for fall 1997), and others (n=248 for fall 1992, $n$=487 for fall 1997) groups. The other group included American Indian, Asian, Hispanic, non-resident alien, and multi-racial students.

## Findings

*Conclusions*

The sample for this study was 9,463 students in fall 1992 and 12,467 students in fall 1997. Overall, attrition and completion rates were greater after the HOPE grant than before, while the graduation rate was greater before the HOPE grant by nearly 10%. The *z*–scores in all categories for attrition rates were statistically significant except in the age categories, 31-35 years and 36-40 years; ethnicity category, other; and the agriculture/natural program and business division. *z*–scores in all categories for completion rates were statistically significant except in the ethnicity category, other. Completion rates were lowest in the health and personal/public divisions. The *z*–scores in all categories for graduation rates were statistically significant except in the ethnicity category, other; and the agriculture/natural program.

Of the total sample of 12,467 students from fall 1997, 4,667 students received need-based financial aid, 5,879 students received HOPE funding, and 1,921 students received no financial aid. The *z*–score for attrition rates between students who received need-based financial aid and those that received the HOPE grant was statistically significant, $z(3591)=-11.75$, $p<.0001$. There was a statistically significant difference in the completion rate of students who received need-based financial aid and those that received the HOPE grant, $z(2041)=-7.51$, $p<.0001$. The completion rate increased by nearly 5% for students who received need-based financial aid compared to students who received only the HOPE grant in 1997. There was a statistically significant *z*–score for the graduation rate of students who received need-based financial aid when compared to those who received the HOPE grant, $z(4914)=17.10$, $p<.0001$. The graduation rates decreased by nearly 17% for those students who received need-based financial aid compared to students who received only the HOPE grant in 1997.

In the type III analysis of effects using logistic regression, a statistically significant relationship existed between the dependent variable, attrition, and all independent variables. A student was less likely to be a leaver in 1992 than in 1997. A statistically significant relationship existed between the dependent variable, completion, and all independent variables. Full-time students were 50% less likely to be completers compared to part-time students. A student was less likely to be a completer in 1992 than in 1997. A statistically significant association also existed between the dependent variable, graduation, and all independent variables. Agricultural students were one third less likely to be graduates compared to students in personal/public programs. A student was more likely to be a graduate in 1992 than in 1997. Controlling for all independent variables, 50% of the total change in attrition rates was attributed to after the initiation of HOPE in 1997. Controlling for all independent variables, 37% of the total change in graduation rates was attributed to after the initiation of the HOPE in 1997. These results provide evidence of the association of the HOPE grant to the dependent variables, attrition, completion, and graduation, and how the independent variables illustrate this association relationship.

*Summary*

Attrition rates increased from 1992 to 1997 for all independent variables except for the ethnicity, others category, and the agricultural/natural program division. Completion rates increased from 1992 to 1997 in all independent variables except ethnicity, other. Graduation rates decreased from 1992 to 1997 for all independent variables except ethnicity, others, and the agricultural/natural program division. Attrition rates were higher for students who received the HOPE grant compared to students who received need-based financial aid for students in 1997. Completion rates in 1997 were higher for students who received the HOPE grant compared to students who received need-based financial aid. Graduation rates were lower in 1997 for students who received the HOPE grant compared to students who received need-based financial aid. All independent variables—full-time and part-time enrollment status, age, gender, ethnicity, and program divisions—had an effect on attrition, completion and graduation rates. The parameters that best predicted a leaver included being female, Black, between 16-20 years of age, part-time, and enrolled in a business program in 1997. The parameters that best predicted a completer were male, White, between 26-30 years of age, part-time, and in an agricultural program in 1997. The parameters that best predicted a graduate included being female, White, between the ages of 36-40, full-time, and in a health program in 1992. Controlling for all independent variables the percentage of leavers changed from 27.5% in 1992 to 30.6% in 1997. Controlling for all independent variables the percentage of completers changed from 17.8% in 1992 to 18.3% in 1997. Controlling for all independent variables the percentage of graduates changed from 54.7% in 1992 to 51% in 1997. Controlling for all independent variables in the study 50% of the total change in attrition rates is contributed after the initiation of the HOPE. Controlling for all independent variables in the study 37% of the total change in graduation rates is contributed after the initiation of the HOPE.

In conclusion, overall attrition and completion rates were greater after the HOPE grant than before, while the graduation rate was greater before the HOPE grant by nearly 10%. Attrition rates were less and graduation rates were higher for students receiving need-based financial aid compared to students that received the HOPE grant. The program divisions, health and personal public services, have the highest graduation rates, 58% and 61%, respectively. Results of this study should be compared with other studies of attrition, completion, and graduation rates to note if similar changes reported in this study were apparent in other schools.

## Discussion

The study of student attrition in postsecondary education is an endeavor that takes on much importance as colleges work to retain students. Historically, approximately one-half of all traditional freshmen entering college ultimately graduate, conversely the attrition rate for nontraditional students is close to 60% (Lombard, 1992). In fact, of roughly three million students who first enrolled in

two-year postsecondary institutions in 1995-96, 36% did not earn a degree or certificate and were no longer enrolled in school, 6% did not earn a degree but were still in enrolled in school, and 58% had attained a degree or certificate after three years (Berkner, Carroll, Clune, & Horn, 2000).

According to Tinto (1987), student's decisions to withdraw stem most often from personal, social, and financial problems. Nippert (2000) concluded that women are somewhat more likely to complete their degree than men and that academic activities, college GPA, and choosing to re-enroll have a positive effect on educational attainment. Bean and Metzner (1985) concluded that older students (nontraditional) drop out of school because of one or more of the following variables academic performance, intent to leave, previous performance and educational goals, and environmental variables.

In this study 9,463 students from fall 1992 were included with 2,907 designated as leavers a 30.7% attrition rate. In the comparison cohort from fall 1997, 12,467 students were studied with 4,442 students designated as leavers for an attrition rate of 35.6%. If the attrition rate were the same in 1997 as in 1992, an additional 612 students would have been completers or graduates in the group of students studied from 1997. The attrition rate of 35.6% is a 5% increase from 1992 to 1997 and is similar to that stated in the study of more than three million students in two-year postsecondary institutions. Tom (1999) reported the following reasons could be interpreted as contributing to attrition: 27% reported that loss of income was a major reason, 30% cited conflict of job and school as a major reason, and 21% mentioned the untimeliness of course offerings. Tom's findings suggest that finances and conflict of job and school are related to the attrition of the student. K. Breeden (personal communication on December 19, 2000) suggested that typically, when unemployment rates decline, school enrollment and retention decreases because it is easier to find employment. An expanding economy will likely produce greater attrition (Walleri, 1981). However, DTAE has set new enrollment records every quarter for more than 35 consecutive quarters (Georgia Department of Technical and Adult Education, 2000). According to the DTAE Statistical Information FY 2000, 46,076 students were enrolled in credit programs in fiscal year 1990 with 6,227 graduates; and 101,194 students were enrolled in credit programs in fiscal year 2000 with 15,304 graduates. According to the Bureau of Labor Statistics Data (2000), the unemployment rate for Georgia in November 1990 was 6.1% and the unemployment rate was 3.0% for November 2000.

It is difficult to compare attrition, completion, and graduation rates in Georgia's technical colleges from year to year because there is limited data published from the Department of Technical and Adult Education. However, there have been other sources to discuss attrition, completion and graduation rates. According to the American Medical Association (2000), data collected from 4,365 programs and 203,838 students indicated that attrition rates range from a low 2% to a high of 33.3% and an average 11.8% attrition in various medical programs in the United States. Attrition rates in the health division at Georgia's technical colleges were

28% in 1992 and 34% in 1997. The attrition rates are higher than the national average. Completion rates were lowest in the health and personal/public divisions. This may be because students in health and personal/public divisions must complete the entire program of study to qualify to sit for state and national certification exams. The program divisions, health and personal/public services, have the highest graduation rates, 58% and 61%, respectively. Most programs in these divisions have measurable outcomes for the graduates such as certification exams. In the other program divisions, the programs have very few measurable outcomes, such as certification exams, that may attribute to their lower graduation rates and higher completion rates as compared to the health and personal/public divisions. Completion rates were higher for part-time students than for full-time students. This could be due to the fact that students who attend school on a part-time basis are likely to be employed. Eighty-five percent of students enrolled in Georgia's technical colleges are employed in the labor force (Georgia Department of Technical and Adult Education, 2000). In fact, much attrition in vocational-technical education can be explained simply by students leaving school due to job opportunities, especially where and when there is a shortage of skilled laborers (Walleri, 1981). Bean and Metzner (1985) indicated that environmental variables (finances, hours or employment, outside encouragement, family responsibilities, and opportunity to transfer) have a greater impact on decisions of adult students to leave than academic variables (study habits, academic advising, absenteeism, major certainty, and course availability).

Attrition and completion rates were lower and graduation rates were higher for students who received need-based financial aid compared to students who received the HOPE grant. Attrition rates increased by 5% after the initiation of the HOPE grant, while the graduation rate was greater before HOPE by 10%. Roslund (1998) completed a study of 600 non-returning students from Davenport College Career Center and found that financial aid problems were the number one reason for not returning.

I found that parameters that best predict a *leaver* include being female, Black, between the ages of 16-20, part-time, and enrolled in a business program in 1997. Parameters that best predict a *completer* includes being male, White, between the ages of 26-30, part-time, and in an agricultural program in 1997. The parameters that best predict a *graduate* includes being female, White, between the ages of 36-40, full-time, and in a health program in 1992. Knowing these predictors is valuable to the management of all technical colleges. By recognizing characteristics of students that can predict a student leaving prior to graduation, interventions can be put into place to help the student succeed in school. Students can be identified who need additional assistance once the characteristics of students who have a tendency to not succeed are recognized.

Overall attrition rates increased by 6% and completion rates increased by 5% after the HOPE grant, while the graduation rate was greater before the HOPE grant by nearly 10%. All of these rate changes were statistically significant. The sample

size for the study was 9,463 student in 1992 and 12,467 in 1997. To compare students who received HOPE grant funds to students who received need-based financial aid the sample size was 5,879 students who received HOPE funding and 4,667 students who received need-based financial aid. Large sample sizes can produce statistically significant result even though there is limited practical significance associated with the findings (Huck, 2000). All of the independent variables had an affect on attrition, completion, and graduation rates. In a practical sense, controlling for all of the independent variables in the study, 50% of the total change in attrition rates is attributed to after the initiation of the HOPE in 1997 and controlling for all of the independent variables in the study 37% of the total change in graduation rates is attributed to after the initiation of the HOPE in 1997. Changes in attrition, completion, and graduation rates reported in this study, should be further researched to confirm the results in this study and recommendations put into place to increase graduation rates and decrease attrition rates.

## References

American Medical Association. (1999). *Number of programs and enrollments, attrition, and graduation by occupation academic year 1998-1999* [Brochure]. Author.

Barton, P. (1997, November 14). Toward inequality: Disturbing trends in higher education. *Policy Information Center.* Retrieved June 12, 2000 from http://www.ets.org/research/pic/towine.html

Bean, J. P., & Metzner, B. S. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research, 55*, 485-540.

Berkner, L., Carroll, D., Clune, M., & Horn, L. (2000, April). *Beginning postsecondary students longitudinal study: Descriptive summary of 1995-96 beginning postsecondary students: Three years later* (NCES 2000-154) Washington, DC: National Center for Education Statistics.

Bureau of Labor Statistics. (2000, May 17). *College enrollment and work activity of 1999 high school graduates.* Retrieved December 22, 2000 from http://stats.bls.gov/newsrels.htm

Bureau of Labor Statistics Data. (2000, December 22). *Local area unemployment statistics.* Retrieved December 22, 2000 from http://146.142.4.24/cgi-bin/ SeriesHist?lasst13000003

Catt, S. R. (1998). Adjustment problems of freshman attending a distant, non-residential community college. (Doctoral dissertation, University of Pittsburgh, 1998).

College Board Online. (1996, Summer). Organizational issues in enrollment management. *Enrollment Management Review.* Retrieved March 30, 2000 from http://www.collegeboard.com/aes/emr/emrsu96/ html/organize.html

Council on Occupational Education. (2000). *Handbook of accreditation 2000 edition.* Atlanta: Author.

Department of Technical and Adult Education. (2000, December 1). *Statistical information FY 2000.* Atlanta: Author.

DeSalvatore, K., & Hughes, L. (2000). *30th annual survey report 1998-99 academic year.* New York: National Association of State Student Grant and Aid Programs, New York State Higher Education Services Corporation.

Gall, M., Borg, W., & Gall, J. (1996). *Educational research an introduction* (6 th ed.). White Plains, NY: Longman.

Georgia Department of Technical and Adult Education [DTAE]. (1999). *1999 annual report.* Atlanta: DTAE Communications Office.

Georgia Department of Technical and Adult Education [DTAE]. (2000a). *Knowledge management system* [Enrollment reports]. Retrieved January 1, 2001 from http://kms.dtae.org/

Georgia Department of Technical and Adult Education [DTAE]. (2000b). *Annual report 2000*. Atlanta: DTAE Communications Office.

Georgia Department of Technical and Adult Education [DTAE]. (2000c). *Policy manual of the state board of technical and adult education.* Retrieved May 3, 2001 from http://www.dtae.org/policy/policy.html

Georgia Department of Technical and Adult Education. (2000d). *Results.* Atlanta: Office of Economic Development Programs.

Georgia Student Finance Commission. (1999). *Celebrating achievement annual report 1999.* Atlanta: Author.

Georgia Student Finance Commission. (2000a). *HOPE scholarship program*. Retrieved December 15, 2000 from http://www.gsfc.org/gsfc/html_summary_grant_all_cov_H.htm

Georgia Student Finance Commission. (2000b). *Georgia's HOPE scholarship program: Regulations for the 2000-2001 academic year.* Atlanta: Author.

Georgia Student Finance Commission. (2000c). *Georgia's HOPE scholarship program: Program summary.* Retrieved September 19, 2000 http://www.gsfc.org/press_release/hopefaq.cfm

Georgia Student Finance Commission. (2000d). *High school academic requirements.* Retrieved December 15, 2000 from http://www.gsfc.org/hope/hop2000.htm

Horton, S. G. (1998). Using academic and demographic variables to predict success in the general education curriculum. (Doctoral dissertation, Louisiana State University, 1998).

Huck, S. (2000). *Reading statistics and research* (3rd ed). New York: Longman.

Kerka, S. (1995). *Adult learner retention revisited*. Retrieved March 6, 1999 from http://ericacve.org/docs/ dig166.html

Lombard, R. (1992). Persistence of nontraditional students in a two-year college: A test of the Bean and Metzner model. *Dissertation Abstracts International, 53.* (University Microfilms No. 9226453).

Metzner, B.S., & Bean, J.P. (1987). The estimation of a conceptual model of nontraditional undergraduate student attrition. *Research in Higher Education, 27*, 15-38.

Nippert, K. (2000). Influences on the educational degree attainment of two-year college students. *Journal of College Student Retention: Research, Theory & Practice, 2*(1), 29-40.

Pardee, R. L. (1992, March). *A descriptive profile of returning students, and the influences affecting the re-enrollment in college.* Paper presented at the annual research conference of the Community College League, CA: (ERIC Document Reproduction Service No. ED 342 436)

Roslund, S. (1998). Post-secondary retention of the non-traditional student at the Davenport college career center. (Master's thesis, Grand Valley State University, 1998).

St. John, E. P. (1991). The impact of student financial aid: A review of recent research. *Journal of Student Financial Aid, 21*(1), 18-32.

St. John, E. P. (1992). Workable models for institutional research on the impact of student financial aid. *Journal of Student Financial Aid, 22*(3), 13-26.

Tinto, V. (1982). Limits of theory and practice in student attrition. *Journal of Higher Education, 53*, 687-670.

Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition.* Chicago: University of Chicago Press.

Tinto, V. (1988). Stages of student departure. *Journal of Higher Education, 59*, 438-454.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). Chicago: University of Chicago Press.

Tom, G. (1999). A post-mortem study of student attrition at the college of business administration. *Journal of College Student Retention: Research, Theory & Practice, 1*(3), 267-287.

Walleri, D. R. (1981, April 6). *Student retention and attrition in the community college: A review and research design.* (ERIC Document Reproduction Service No 210 064)

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*Journal of Vocational Education Research, 27(3), pp. 293-308.*


# The Curriculum Internationalization Process in Banking and Finance School-to-Work Programs: A Cross Case Study

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## Abstract

*To meet the demand for workers with high-tech skills and an understanding of international business, America's schools have initiated school-to-work and international education programs. This study described the internationalization process of two banking and finance school-to-work programs, a German youth apprenticeship and an American career academy program. Qualitative case design was used to provide detailed descriptions of the internationalization phenomena, content and methodology, taking place in these bounded programs. Recommendations include conducting longitudinal research to more fully understand the phenomena studied. An extension of this would be research in additional countries. Research on curriculum internationalization may lead to a better mix between infusion and inclusion methods, resulting in optimal learning by students. Research on international concepts in teacher educator programs may shed light on the need for professional development.*

Entering his upper level finance class one mid-November morning, Herr Seifarth (Mr. Seifarth) quickly caught the classes' attention by asking, "What happened in a small town in Connecticut in 1944?" Perhaps not yet awake for this eight o'clock class or because they simply didn't know the answer, the students dodged the question by asking, "Where is Connecticut?" Seifarth responded curtly, "The USA." Avoiding further evasion, Seifarth quickly threw out a second question, "What has happened since the time of the [second world] war?"

Thinking that he might not receive the needed responses from the students, Herr Seifarth began his lesson on the development of the international financial markets. By recalling historical events, Seifarth laid the foundation for understanding current banking practices, products, and market theory. He explained that 1944 was a pivotal year in banking because the world's leading nations—the United States, Great Britain, France, and Russia—convened to reestablish international trade by developing universal standards of practice for trade. More important, he noted, the group of nations agreed to "tie their currency's value to the price of gold and to make them gold exchangeable at any time. By doing so, the group hoped to restore stability to the world economy." Finally, Seifarth explained that the 1944

conference created the International Monetary Fund, predecessor to the World Bank, which would serve as the clearinghouse for international transactions and lending.

As Herr Seifarth conveyed this information, students listened quietly, making notes of key information for future reference. With the introduction of the gold-backed currency topic, however, several students raised their heads as if to question the instructor's information. Understanding their confusion—currencies are no longer backed by gold—Seifarth resisted the urge to immediately clarify the students' questions, choosing, instead, to move forward in time to the Korean and Vietnam war eras. Following several general statements about the countries involved in these conflicts, he asked the students, "Why was Vietnam so difficult for the Americans?" Excitedly, the students cried out about the conflict's atrocities, that Nixon was president, and that a number of African-American soldiers died in Vietnam. Agreeing with their comments but needing an effective means of challenging the students to consider the significance of the era on banking, Seifarth proclaimed, "But, they [the U.S.] lost the war." All agreed, but the students' quizzical looks indicated that they did not see the significance of the loss.

With a patient voice, Herr Seifarth explained that the American economy was doing poorly due to a lack of support for the conflict both at home and abroad. Fewer American goods were being sold domestically and internationally, resulting in a decrease in production and, therefore, an overall slowdown in the American economy. As the economy slowed, it became increasingly difficult for the United States to maintain gold deposits that backed outstanding dollars one-for-one. In an effort to eliminate deposit problems, Nixon took the dollar off of the gold standard allowing both dollar and gold prices to be traded freely in the open market and laying the foundation for today's foreign exchange and capital markets (classroom observation, November 17, 1998).

Some four months later and 4,000 miles from Bensheim, Germany, Academy of Finance students at Forest Park High School in Forest Park, Georgia, settled into their International Finance class. Following roll call, Ms. Phillips asked the students, "What do you know about the gold standard?" (classroom observations, March 19, 1999). With this, the group began a review of the history of fixed and floating exchange rates.

Though fine details between these two classroom events varied, each discussion focused on historical events and currency pricing theory while touching on factors that have contributed to the development of modern financial markets. More important to this study, these presentations highlighted a number of international business and banking concepts found in both the written and observed curriculum of a German Banking and Finance youth apprenticeship program and an American Academy of Finance career academy program. Finally, these events provided insight into the methods used for internationalizing each program's curriculum.

## Purpose and Objectives

The purpose of this study was to describe the curriculum internationalization process-taking place in two banking and finance school-to-work programs; specifically, the international business and banking concepts found in the written and observed curricula used in a youth apprenticeship program in Germany and a career academy program in the United States. A second purpose of this study was to identify the curriculum internationalization method—infusion, inclusion, or both—used by each of the programs. To guide the research, four questions were developed. These questions were:

1. What international business and banking concepts appeared in the curriculum of a German banking and finance youth apprenticeship program?
2. How was the curriculum of the German banking and finance youth apprenticeship program internationalized?
3. What international business and banking concepts appeared in the curriculum of an American banking and finance career academy program?
4. How was the curriculum of the American banking and finance career academy program internationalized?

## Conceptual Framework

Advances in technology now enable corporations and individuals to conduct business around the clock and around the world. As a result, the United States has become an integral part of the rapidly developing global economy that influences the form and shape of business in the U.S. and every other nation. One industry that has been radically affected by technological advances and the development of the global economy is the banking and finance industry (Dietrich, 1996; McMillan, 1995). For example, in 1980, outstanding foreign loans to corporations totaled $5 billion and largely represented trade financing. This figure grew to $125 billion in 1993, an increase of 2,500%, and represented foreign direct investment by American corporations, foreign office working capital financing, as well as trade financing (Dietrich, U.S. Department of Commerce, 1994).

To meet the demand for workers with high-tech skills and an understanding of international business terms, theories, and practice, America's public schools have initiated a number of programs, including school-to-work (Dornsife, Finkelstein, Latting, Stern, & Stone, 1994) that focus on integrating academic and career technical education with international education for a single educational format (Tye & Tye, 1992). While school-to-work programs strive to coordinate what takes place in school with students' work experiences (Kazis, 1993; Smith & Rojewski, 1993), schools have adopted an internationalized curriculum that focuses on the interdependence of the world's economic, environmental, political, and cultural systems and how this interdependence influences domestic events and policies.

Along with the success students may experience at school and work through school-to-work programs, members of government, business, and education hope to reduce high school dropout rates, increase employment rates among young adults, enhance basic skills, and generally benefit the American economy (Dornsife et al., 1994). Similar programs in schools of other industrialized nations (e.g., Denmark, Germany, Sweden, United Kingdom) are perceived as contributing to these countries' economic successes, high literacy rates, and low unemployment rates (Kiester, 1993; Office of Technology Assessment, 1990; Schlicht, 1995). Therefore, an American-style school-to-work program may result in similarly favorable outcomes.

While school-to-work programs address student needs for high-tech, complex skills and problem solving abilities, student employment opportunities may be further enhanced when the school-to-work curriculum has been internationalized to reflect the global nature of the economy and daily life (Cavusgil, 1993). Two programs, one domestic and one foreign, that have focused on meeting the high-tech skills and international knowledge needs of the banking and finance industry are Karl Kübel's Banking and Finance youth apprenticeship program in Germany and Forest Park High School's Academy of Finance career academy program in the United States.

While much has been written about school-to-work programs and the rationale for internationalizing the curriculum, a review of the literature for both school-to-work programs and international education found no studies on the internationalization of school-to-work programs in Germany or the United States. Therefore, this study examined the school-to-work curriculum for international themes and how they were introduced in the curriculum.

## Method

*Design and Sample*

A qualitative case study approach was chosen. The decision to use qualitative research was driven by a lack of exploration on the study topic (Merriam, 1998, Stake, 1995). Further, detailed description of phenomena taking place in bounded programs was sought (Miles & Huberman, 1994). As a result, the case study approach would lead to the "discovery of new meaning, extend the reader's experience, or confirm what is known" (Merriam, p. 30), which may inform educational practice and curriculum planning.

A purposive sample based on convenience (Merriam, 1998) was used to select both the German banking and finance youth apprenticeship program and the American career academy program. These school-to-work programs were selected as units of analysis as they represented current educational initiatives and were bounded by program parameters, thus, facilitating the case study research approach. Further, banking and finance programs were selected as this industry has experienced long-term exposure to international business. Therefore, banking and

finance programs should reflect the internationalization process that has taken place in the industry.

To develop holistic case studies, two data collection strategies were employed, document review and observation. By utilizing multiple data sources, findings were affirmed and vigor built into the study (Creswell, 1998; Merriam, 1998; Patton 1990; Stake, 1995). Data was collected over a seven-month period, three and one-half months for each program, beginning with a review of relevant documents and ending with classroom observations. Classroom observations, however, made up the bulk of the research conducted on-site. Observations were conducted over an eight-week period at each site in increments of three to six hours per observation. In Germany, observations took place throughout the week. In the United States, observations were conducted two or three days per week, reflecting the school's block scheduling format. I, as researcher, served as the primary instrument for data collection, which allowed me to *take-in* the same environment and experiences as the students; thus, facilitating the development of an emic perspective of the phenomena being researched (Merriam, 1998).

*International Business and Banking Concepts List*

In preparing for this study and to expedite document reviews, an analysis of six recent international business and banking textbooks was conducted. From this analysis, a detailed list of 80 terms, topics, theories, and practices—collectively referred to as the international business and banking concepts list in this study—was developed that addressed international subjects found in the fields of accounting, banking, economics, finance, and marketing. This list was arranged in unranked, alphabetical order. Additional analysis of these concepts resulted in the development of nine general categories. These categories and the number of concepts per category were Cultural and Social Factors (2), International Accounting (1), International Banking (14), International Economics (15), International Marketing (5), International Money Markets (15), International Organizations and Agreements (10), International Trade (12), and Multinational Corporate Structures (6).

The concepts list was used predominantly in the curriculum content analysis. It should be noted, however, that the concepts list was not intended to serve as a standard for the international business and banking curricula. Rather, it served as a reflection of current practice and, therefore, provided a framework for analyzing the large collection of material reviewed.

## Results, Discussion, and Implications

Prior to discussing comparative results, an overview of findings for each case is provided, beginning with the German case. Each discussion includes a review of the international business and banking concepts found in the written and observed curriculum, as well as a review of the curriculum internationalization methods

results. This section ends with a comparative discussion of results, which may have implications for future research in curriculum internationalization and banking and finance school-to-work program curricula.

## *Karl Kübel Banking and Finance Program*

Karl Kübel's Banking and Finance youth apprenticeship program is designed as a 2- or 3-year program and includes studies in accounting, banking, investing, and economics. Computer and English courses are also taught, though each is treated much like a workshop, meeting only sporadically. All of Karl Kübel's upper-level banking and finance students hold apprenticeship positions and work two to three days per week, attending classes the remaining days.

In the 1998-1999 school year, Karl Kübel's banking program included 115 students, 60 men and 55 women ranging in age from 16 to 22 years old. Observations indicated that this was not a homogeneous group, but ethnic diversity among the program's students was limited. Students were typically native Germans.

### *International Business and Banking Concepts*

Prior to discussing the results of the German case study, it should be noted that Germany's proximity to foreign countries and, therefore their currencies, might have benefited the internationalization process in Karl Kübel's banking and finance program. Additionally, the country's involvement in the development of the European Economic Community (EEC) places Germany, its workers, and potential workers in a unique position. As the seat of the European central bank, employees of the bank will require a strong knowledge of international banking. Foreseeing this demand, Germany's banking and finance youth apprenticeship programs may have enhanced the international aspects of their programs.

In the state of Hessen, Grill and Perczynski's (1998) *Wirtschaftslehre des Kreditwesens* (Economic Teachings for Credit Knowledge) served as the primary text for Karl Kübel's school-based program. The text addressed current practices, theory, and legislation of the banking and finance industry. A second text used by Karl Kübel's banking and finance students was the individual bank's *Studienplanen* (student courses). Upon entering the apprenticeship program, and throughout their work-based program, students participated in site-based workshops that reviewed material from the school-based curriculum, but also addressed individual bank practices. A comparison of the school- and work-based curriculum found that, for the most part, each mirrored the other. The bank text, however, gave step-by-step transaction descriptions, explained technical forms, and showed mathematical calculations.

*Written curriculum.* Of the 80 items appearing on the international business and banking concepts list, a total of 66 were found in Karl Kübel's written curriculum. Concepts found in the state text totaled 62, while 48 concepts were found in the

bank text. Of the 62 concepts found in the state text, 41 were concentrated in the categories of International Banking, International Money Markets, and International Trade. Missing concepts were concentrated in the categories of International Organizations and Agreements and Multinational Corporate Structures, which may reflect the fact that American texts were used to develop the international business and banking concepts list. Of the ten possible concepts found in the International Organization and Agreements category, only three were found in Karl Kübel's written curriculum. Within the Multinational Corporate Structures category, none of the six possible concepts were identified. Additional concepts missing from the Karl Kübel's curricula were in the category of International Marketing. Finally, Karl Kübel's written curriculum did not specifically address the values concepts found in the Cultural and Social Factors category.

Had a longitudinal study of Karl Kübel's banking and finance program been conducted, it is possible that missing concepts from the above categories may have been identified in handouts or other documents not made available to the researcher. However, as multiple items from the International Organizations and Agreements and Multinational Corporate Structures categories were missing, it's appropriate to suggest that these concepts did not take precedence in Germany's banking and finance curriculum. This assertion is further supported by the fact that only those concepts (e.g., Bank of International Settlements, European Economic Community, and European Union) that directly impact Germany's banking and finance industry were addressed in the International Organizations and Agreements category.

*Observed curriculum.* While the state and bank texts were each reviewed for the presence of international business banking concepts, curriculum observations were limited to courses that took place at Karl Kübel. From these observations, 42 of the 80 concepts were present. Of the 42, the International Money Market category was the only category to have all possible concepts, 15, to appear in classroom presentations. More importantly, concepts from the category were repeatedly observed, over 20 times, by the researcher, suggesting that student exposure and understanding of concepts within this category were of particular importance for Karl Kübel's banking and finance students.

Similar results were also found for the International Banking category, which had the second highest number of observed concepts, 10 out of a possible 15. Eighteen presentations were given on these concepts. Again, the repetition of concepts from the category suggests a level of importance to students.

*Curriculum Internationalization*

*Written curriculum.* The infusion method of curriculum internationalization calls for international themes and topics to be woven into a program's existing curriculum. Such was the case for the international business and banking concepts found in the curricula of Karl Kübel's banking and finance program, both state and

bank texts. International concepts were systematically interwoven with presentations on domestic banking transactions, suggesting a natural progression of knowledge to the learner. Each text began with fundamentals about a concept and built on this foundation while introducing new and increasingly more complex information, including the international business and banking concepts relative to the topic.

*Observed curriculum.* Mimicking the state text, the international business and banking concepts were identified throughout Karl Kübel's observed curriculum. During the observation period, classes reviewed the topics of international accounts, lending, credit, economic structures, trade, and market transactions. Like the texts, classroom presentations progressed from introductory information to complex transactions and from a focus on domestic business to foreign business.

Though this study did not research the effects of the infusion method of curriculum internationalization on the attainment of knowledge, the depth and complexity of the international concepts studied in the latter portion of Karl Kübel's program (e.g., the DuPont pricing model, hedge pricing) suggest that the infusion method, as well as the repetition of material, may enhance the learning experience. However, Germany's core math curriculum, completed prior in secondary schools, may have provided a foundation that allowed for advanced study in the *Berufsschule* (upper secondary school). Examination of student transcripts and comparison with American math courses may provide additional insight into this phenomenon.

### *Forest Park High School Academy of Finance*

The Academy of Finance (AOF) program is designed as a 2-, 3-, or 4-year program and includes studies in accounting, banking and credit, economics, financial planning, international finance, and securities operations. Computer courses are also encouraged. For the work-based component of the program, 10th grade students participate in job shadowing while 11th graders complete internships. Both of these experiences take place during the summer months.

The AOF program used in this study was located in Forest Park, Georgia, a city neighboring Atlanta. The program was established in 1995 in an effort to offer students a "different school experience that would help them succeed after high school" (AOF Instructor, 1999). During the 1998-1999 school year, the AOF program included 37 students, 11 seniors, 11 juniors, and 15 sophomores. Of the 37, 24 were females and 13 were males. Though ethnicity figures for the group were not available, observation and student verification identified the students as being African-American, Caucasian, Hispanic, and Asian.

#### *International Business and Banking Concepts*

As the National Academy Foundation (NAF) designed the curriculum for the Academy of Finance, research for this case began with document reviews at NAF's

New York office and was continued at Forest Park High School. Documents included in the review were NAF promotional literature, annual reports, and the AOF's course curricula, the central focus of the review.

*Written curriculum.* Using the international business and banking concepts list as a guide, Forest Park's AOF curriculum included 78 of the possible 80 terms, topics, theories, and practices. Missing concepts included the handling of foreign denominated deposit accounts from the International Banking category and the theory of branding and packaging for foreign markets from the International Marketing category. As 98% of the possible international business and banking concepts were found in the written curriculum, it is appropriate to suggest that the missing concepts were overlooked or intentionally omitted by curriculum writers.

Further investigation of the AOF curriculum materials found that 74% of the international business and banking concepts were concentrated in the program's capstone course, *International Finance*. The second and third greatest concentrations were found in *Economics*, 49%, and *Banking and Credit*, 23%. These results suggest that had *International Finance* not been offered in the AOF program, students' exposure to and work with international concepts would have been minimal, if not, non-existent.

Among the international business and banking concepts found in the AOF curriculum, foreign exchange transactions received the greatest attention. Topics ranged from currency names and spot rate values to hedging products that reduced exchange rate exposure. These concepts were found in five of the six AOF courses, suggesting that students' needed a strong knowledge of foreign exchange transactions to complete courses and obtain positions in banking and finance.

*Observed curriculum.* While a majority of the international business and banking concepts were found in the written curriculum, classroom observations did not yield as bountiful an outcome. Specifically, only 24 of the 80 concepts were observed. Although not all the courses were observed due to study restrictions, the observation period did coincide with the semester in which *International Finance* was taught. Classes not observed included *Personal Finance* and *Banking and Credit*.

Given that *International Finance* possessed the greatest opportunity for observing the international concepts, higher observation results would be anticipated. The low numbers, however, suggest that external factors were prohibiting the teaching of this course. These factors may include the lack of professional development in international business of the instructor and administrative duties. From these, the greatest inhibitor would appear to be the lack of professional development. The instructor, herself, commented that she "really didn't know this material, and . . . [hadn't] had time to try and learn it." The second barrier appeared to be administrative demands that took time from the class. The AOF coordinator was forced to use class time to address plans for the AOF senior trip. State testing also cut into instructional time.

*Curriculum Internationalization*

Reviewing the Academy of Finance curricula, the researcher noted that both infusion and inclusion methods for internationalizing the curriculum were used. While infusion of the international business and banking concepts prevailed in the *Accounting*, *Banking and Credit*, *Economics*, and *Securities Operations* courses, the inclusion method was represented by the *International Finance* course, which was an independent course solely focused on international finance topics.

*Written curriculum.* Within courses being internationalized through infusion, international business and banking concepts appeared with varying foci and in varying locations. In *Economics*, international concepts were introduced early on. However, detailed and in-depth discussion of international economics did not begin until Chapter 14, page 330. Similar delays in international lessons were found in the *Accounting*, *Banking and Credit*, and *Securities Operations* texts.

One result of the postponement of international topics to the latter portion of a text may be that the chapters are never taught. This result is supported by research at Forest Park where international topics in *Accounting* and *Economics* were not covered in class as neither of these courses reached the appropriate chapters in the texts. A second result may be that these chapters are reviewed quickly at the end of the term, inhibiting the learning process for the students. Per one AOF student, this was the case for the international concepts discussed in the *Securities Operations* course. During discussion in *International Finance*, the student commented that he didn't "really remember the material because we went over it so fast at the end of last semester."

Implications from these results are that students may be unprepared for future classes, specifically *International Finance*, as they have not learned the international fundamentals taught in prior courses. Further, time is taken away from advanced level international business and banking concepts taught in *International Finance* to learn the needed material. A final implication is that students graduating from Forest Park's AOF program may not be prepared for entry-level international banking positions though this is a goal of the program.

*Observed curriculum.* Unlike the written texts, inclusion served as the primary method for internationalizing the Academy of Finance classroom curriculum. As previously noted, 24 of the 80 international business and banking concepts were observed in the AOF curriculum. Of the 24, all but one occurred in the *International Finance* course. The remaining item, accounting for international sales, was observed in the *Accounting* course and was part of a general discussion of sales journals. As this concept was included in the general discussion of sales, this presentation is representative of the infusion curriculum internationalization method.

Given Forest Park's dependence on the inclusion method for internationalizing the Academy of Finance program, it is fitting to suggest that greater focus should

be given to the delivery of material in the *International Finance* course. This further implies that students must possess the preliminary information needed for the course. Therefore, care should be taken to deliver lessons containing international business and banking concepts found in earlier courses.

## Comparative Discussion

The introduction to this article provides a unique look at a single lesson being taught in both Karl Kübel's Banking and Finance youth apprenticeship program and Forest Park's Academy of Finance program. In retelling these events, the reader peeks inside each program, discovering the international business and banking concepts being taught and the means for internationalizing each.

Beyond the concepts and internationalization methods, these vignettes provide insight into the qualities and characteristics of each program, as well as the similarities and differences between the programs. Along with a discussion of the written and observed international business and banking concepts found in the programs, the following discussion focuses on the shared qualities: program structure, international business and banking concepts, instructional methods, as well as those characteristics that differentiate the two programs: work-based experience, internationalization process, knowledge building, and teacher preparation.

### *Similarities*

*Program structure.* Throughout the research period, a number of similarities between Karl Kübel's Banking and Finance and Forest Park's Academy of Finance programs emerged. First, each program was concentrated into a two-year sequence that included both school-based and work-based components. Though the length of work assignments, discussed later, differed between programs, work-based experiences were considered important in both programs for the student's knowledge and skill development.

Second, students in both programs were placed in cohort groups. At Karl Kübel, cohort placements reflected the students' previous educational pursuits, while Forest Park's cohort groups reflected high school standing. For both programs, the use of cohorts appeared to facilitate the learning process. Students developed study groups and appeared to share their knowledge freely within the study groups as well as the cohort group.

Third, the course work for each program was comparable. Both programs contained work in accounting, economics, banking, finance, and securities. Though the AOF used a series of distinct, individual courses over the two-year period to convey the curricula, the content of Karl Kübel's program was compiled in a single text that was supplemented by articles and other materials. The AOF also utilized non-text materials in their program.

These findings offer several suggestions for career technical directors and school-to-work program developers. Along with retaining the school- and work-based components of career and technical programs, administrators may also incorporate cohort groups into their programs as these experiences appear to reinforce the student's attainment of knowledge and skills while also enhancing the curriculum.

*International business and banking concepts.* Like the programs' courses, the international business and banking concepts found in the written curriculum of Karl Kübel's program were very similar to those found in Forest Park's program. The curricula of both programs addressed a majority of the concepts identified for this study. Although neither the number nor the depth of coverage of the concepts were identical, the study's findings suggest that program developers place international topics as a priority. This finding may, in turn, reflect the importance policymakers have placed on developing skills needed to compete in our global economy.

*Instructional methods.* In both Karl Kübel's and Forest Park's program, instruction revolved around lecture, discussion, and book work. At both sites, students were observed taking notes and completing terms and questions from the book or other worksheets. In the U.S., videos were also used to convey information. To involve students in presentations, instructors at both sites were observed leading discussion by asking direct (e.g., what currency is used in Chile?) and indirect (e.g., what can you tell me about Chile?) questions. Finally, both programs used field trips.

Though projects and group work were observed in each program, these incidences were few; and the amount of class time allocated to group work was limited. Further, group assignments frequently centered around answering terms and questions, and rarely were students challenged to use critical thinking skills to solve problems.

While changes in instructional methods are taking place in both the U.S. and Germany, the findings in this study suggest that redirection of effort by teachers is needed. Only when instruction has moved from being teacher-centered to student-centered will students develop the problem solving skills required in today's workplace.

*Differences*

*Work-based experience.* Of the differences noted between Karl Kübel's and Forest Park's programs, the most prominent dealt with the work-based component of the programs. Specifically, Karl Kübel's students completed two-year youth apprenticeship assignments that placed them in banks two to three days per week. In contrast, Forest Park students completed a six- to eight-week summer internship program between their junior and senior years. While all work experience has value, Karl Kübel's students had significantly more opportunity to gain real world

experience, which may have enhanced their school-based work as well as their future employment options.

Second, Karl Kübel's successful banking and finance students completed a certified program that attested to their knowledge and skills. Though their course work was completed in the state of Hessen, graduates were recognized under the German youth apprenticeship system as qualified candidates for any banking and finance position in the country, giving the students even greater flexibility when considering jobs. While Forest Park's Academy of Finance students possess specialized knowledge that may open doors, they would require additional education and training to qualify for many banking and finance positions.

These findings suggest that school-to-work programs must have a lasting commitment to work-based experiences. While students benefit from exposure to the workplace, the skills they learn in the workplace will be enhanced through prolonged exposure.

*Internationalization process.* A further difference between Karl Kübel's and Forest Park's banking and finance program dealt with the curriculum internationalization method. As previously noted, the international business and banking concepts used in this study were found throughout Karl Kübel's written and observed curriculum, reflecting the infusion internationalization method. Forest Park's internationalization method, however, was divided. While much of the written curriculum infused international concepts, the program also relied on a stand-alone course to deliver the international topics, reflecting the inclusion internationalization method. This was confirmed through observation as the bulk of the international concepts were found in the *International Finance* course.

*Knowledge building through the curriculum.* While each program's written curricula addressed the majority of international business and banking concepts, Karl Kübel's program, directly or indirectly, focused on knowledge building. Repetition of concepts was anticipated; however, the early introduction of international concepts and the cumulative nature of topics in the written material was not. Within the first five weeks of entering the program, fundamental international business and banking concepts were introduced. As students progressed through the curricula, these fundamentals were revisited and then expanded upon, occasionally within the same class but often in a future class. The final result was a fully constructed picture of current international business and banking knowledge and practices.

An example of this process was exemplified by the program's lessons on foreign exchange. Students' initial introduction to the concept of foreign exchange took the form of learning currencies' names and identifying spot exchange rates. This was followed by presentations on why individuals and companies might need foreign currencies, means for obtaining foreign currencies, and maintaining foreign denominated accounts. At this point, foreign exchange money markets were introduced into the curricula, and the students learned about world trading markets.

Following reviews of supply and demand, the students were asked to apply their knowledge to exchange rate fluctuations, which was followed by discussions of factors influencing rate fluctuations. Finally, the curriculum addressed the role of government in maintaining a country's currency value.

With their fundamental knowledge of currency names, spot rates, trading arenas, and price fluctuations, banking and finance students were challenged to consider the risks associated with international transactions and, more importantly, methods for avoiding these risks. Students learned that companies may enter into contracts for the delivery of a foreign currency at a future date, which coincides with a company's need to pay, and their knowledge was advanced further when they were asked to calculate contract pricing. Finally, students were encouraged to evaluate an array of derivative products that may control a company's costs or result in earnings.

As this example illustrates, Karl Kübel's banking and finance students began building their knowledge of international business and banking almost immediately. In the United States, however, Forest Park's Academy of Finance curriculum delayed a number of the international business and banking concepts until the *International Finance* course, which was taught in the students' last semester. While international business and banking concepts appeared in courses leading up to *International Finance*, international concepts in these courses were often not covered due to a lack of time. This lack of course work would suggest that Forest Park's Academy of Finance students were not as well prepared for entry-level international banking and finance positions. If additional training were not sought, students' skills would remain deficient.

These findings suggest that internationalization is best achieved through infusion within a given course and throughout a entire program. When developing the program curriculum, the infusion of international concepts provides for the on-going introduction and development of the student's international knowledge. Care, however, must be taken to ensure that infused topics are not skipped or left to the end of a course, and therefore missed altogether. Only when students receive on-going exposure to experience with the internationalized curriculum will the needed knowledge develop.

*Teacher preparation.* While Forest Park's teachers held degrees in business education and had years of experience, neither teacher had studied or taught an international business course nor had they worked for an international organization. Moreover, the teachers did not have the highly specific international finance knowledge needed to teach the course based on both their own comments and their courses of studies. Though Forest Park attempted to address this problem by using an outside instructor, the instructor's lack of professionalism left the students and teachers struggling to learn. In contrast, not only had Karl Kübel's teachers completed studies in banking and finance, but each instructor had also worked as a banking or finance officer. The combination of their education and experience

enhanced their classroom presentations as they drew upon their own studies and work when working with students.

Given our economy's ever-increasing global nature and the need for well-prepared teachers, the above findings suggest that future business education instructors in the United States may benefit from the inclusion of international business courses in their programs of study. Current teachers would benefit from summer employment in the banking and finance industry as well as staff development courses on international business and the internationalization process. Regardless of delivery method, American business educators must internationalize their knowledge.

*Recommendations*

Based on the study's findings and in consideration of the suggestions made earlier in this chapter, the following recommendations address the deficiencies in the curriculum internationalization process of secondary banking and finance school-to-work programs. These recommendations are largely based on the need for additional study as little research has been conducted in the field of curriculum internationalization for school-to-work programs. Future research will extend the foundation provided by this study.

1. Given time limitations, additional study, preferably longitudinal research, should be conducted on both Karl Kübel and Forest Park banking and finance programs. Internationalization research on alternative school-to-work programs should be conducted. Finally, school-to-work programs of other countries should be examined to determine what international business topics are appearing.

2. As work-based learning is a key component of school-to-work programs and given lack of work-based research in the banking and finance industry, further study of the international components in work-based curricula is recommended. Through this and additional research, educators may better understand the effect of on-the-job training on the acquisition of international knowledge.

3. Although theme analysis was conducted to develop the international business and banking concept list used in this study, additional research on the international banking and finance topics, terms, theories, and practices is recommended. Through additional research, the study's concept list may be affirmed or revised, creating a standard against which banking and finance programs may be measured.

4. As both infusion and inclusion curriculum internationalization methods were used by the programs in this study, research to determine the best internationalization mix for the curriculum is recommended.

5. Curriculum development varies from program-to-program and from country-to-country. Thus, research investigating the curriculum decision-making process should be conducted to determine who is making decisions and how these decisions are being implemented.

## References

Cavusgil, S. T. (1993). Internationalization of business education: Defining the challenge. In S. T. Cavusgil (Ed.), *Internationalizing business education: Meeting the challenge* (pp. 1-13). East Lansing: Michigan State University Press.

Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage.

Dietrich, J. K. (1996). *Financial services and financial institutions: Value creation in theory and practice.* Upper Saddle River, NJ: Prentice-Hall.

Dornsife, C., Finkelstein, N., Latting, J., Stern, D., & Stone, J. R. (1994). *Research on school-to-work transition programs in the United States.* Berkeley, CA: National Center for Research in Vocational Education.

Grill, W., & Perczynski, H. (1998). *Wirtschaftslehre des Kreditwesens* [Economic teachings for credit knowledge] (32nd ed.). Bad Homburg vor der Höhe, Germany: Gehlen.

Kazis, R. (1993). *Improving the transition from school to work in the United States.* Washington, DC: American Youth Policy Forum.

Kiester, E., Jr. (1993). Germany prepares kids for good jobs; we were preparing ours for Wendy's. *Smithsonian, 23*(12), 44-55.

McMillan, T. (1995). Global growing pains: A troubling wake-up call from the financial markets alerts the world to a new world order. *Thunderbird: The American Graduate School of International Management, 69*(2), 6-9.

Merriam, S. B. (1998). *Qualitative research and case study applications in education.* San Francisco: Jossey Bass.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage.

Office of Technology Assessment. (1990). *Worker training: Competing in the new international economy* (GPO Doc No. Y3.T 22/2:2 W89/sum). Washington, DC: U.S. Government Printing Office.

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: Sage.

Schlicht, M. (1995). Learning for the working world: Vocational training in the federal republic of Germany. *B&W: Bildung und Wissenschaft* (Education and Science), *4*.

Smith, C. L., & Rojewski, J. W. (1993). School-to-work transition: Alternatives for educational reform. *Youth and Society, 25*(2), 222-250.

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.

Tye, B. B., & Tye, K. A. (1992). *Global education: A study of school change.* Albany: State University of New York Press.

U.S. Department of Commerce. (1995). *U.S. foreign trade highlights: 1994.* Washington, DC: International Trade Administration, Office of Trade and Economic Analysis.

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*Journal of Vocational Education Research, 27(3), pp. 309-318.*


# A Comparison Of Role/Task/Environment Stress Experienced By Beginning Academic and Career-Technical Teachers In Southwestern Ohio Career-Technical Schools

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## Abstract

*Twenty-four academic and 50 career-technical teachers in southwestern Ohio high school career centers were studied to determine which group perceived greater role stress, task stress, and environment stress while teaching and prior to issuance of their professional license. Teachers completed the 67-item Teacher Stress Measure (TSM) developed by L. Pettegrew and G. Wolfe (1981). Career-technical teachers reported higher levels of role and task stress than academic teachers. Academic teachers reported higher levels of environment stress.*

Teaching has many intrinsic and extrinsic rewards for people entering the pedagogical arena. However, teaching is not without its inherent problems. Problems associated with job related stress remain at the top of many teachers' list (Fimian & Fastenau, 1990). Historically, the duties and responsibilities of classroom teachers have been viewed as demanding. Duties such as instructional planning, managing student behavior, interacting with other teachers and administrators professionally, and insuring that programs produce students who can pass state-required proficiency tests to graduate have continued to increase in both complexity and accountability. Accompanying stressors such as meeting with parents, writing new curriculum, grading and evaluating students, and meeting administrative paperwork requirements can produce a great amount of stressful situations for the classroom teacher. As negative stressors increase, teachers new to the profession may not be aware of effective strategies to reduce stress-related problems. Excessive amounts of negative stress can result in decisions to leave secondary teaching for work that has less perceived negative stress.

## Conceptual Framework and Related Literature

Many of the issues surrounding teaching and negative stress in a career center school are derived empirically from the demands placed on both the academic and career-technical teachers. The literature on teachers who experience perceived negative stress in schools identified no clear recommendation as to a conceptual or theoretical model by which to conduct this study. However, Camp (2001) encouraged researchers who study career-technical phenomena to design a theoretical or conceptual framework based upon substantive theory. Camp further

encouraged developing studies with an empirical foundation, with supportable premises, and then extending that premise through a logical path of reported research and clear reasoning.

Pettegrew and Wolfe (1981) developed the Teacher Stress Measure (TSM) to rate teacher role, task, and environment stress. Examination of the stressors commonly found in the career center can also be categorized into these three distinct areas. Both academic and career-technical teachers must cope with teacher role stress, teacher task stress, and school-environment stress. Teacher role stress is defined as the stress associated with the degree of fit between a teacher's expectations of his or her teaching role and the actual work-related experience of fulfilling that role. Teacher task stress concerns problems associated with a variety of specific tasks the teacher must perform in his or her teaching role. School environment stress is associated with specific circumstances or events that may befall teachers in the school in which they work.

Pettegrew and Wolfe (1981) defined the three measures of teacher role, task, and environment stress into subsets of categories. *Role stress* encompasses five specific areas including (a) *role ambiguity*, the absence of clear or adequate information about the role one must perform; (b) *role overload*, the absence of sufficient resources to perform roles adequately; (c) *role conflict*, the presence of two or more incompatible work demands; (d) *nonparticipation,* lack of direct involvement in the decision-making process on issues that specifically affect work, and (e) *role preparedness*, stress due to feelings of a lack of competency or preparation to perform a given role. *Task stress* involves work-related activities that teachers may be asked to perform, that create increased stress anxiety. An example would be serving as in-school detention monitor. *Environment stress* examines the school as an environment that can increase the teachers stress level.

When discussing stress and the role it plays in the lives of teachers, its meaning and application can have several interpretations depending on the situations involved. Teacher stress points to the interaction between teacher and one of several environments: the school, interpersonal, and intra-personal environments. Stress can be conceptualized to include job satisfaction (Kyriacou & Sutcliffe, 1979; Litt & Turk, 1985; Price, 1971; Rudd & Wiseman, 1962), absenteeism (Bridges 1980), intention to leave the profession (Kyriacou & Sutcliffe), and psychological and physical distress (Coates & Thoresen, 1979; Needle, Griffen, & Svendsen, 1979; Taylor & Dean, 1971).

Prince (1988) suggested that stress results when the demands of a situation are perceived to be greater than one's capabilities to meet those demands. An individual does not create stress; rather, it derives from an individual's perception of workplace demands and personal abilities of being able to address those demands. The question arises as to when and how negative stress occurs in a new teacher's occupational life. Issues relating to teacher self-efficacy plays a part in perceiving negative stress related to situations and environments.

Work conditions that are typically attributed to causing teacher stress were cited by Norton (1999) including (a) the variety of administrative routines and paperwork, (b) evaluation of student performance and school grading practices, (c) student behavior and discipline, (d) teacher load and expectations for assuming extra-curricular activities, (e) relationships with peers and administrative personnel including supervisory relationships and communication channels, and (f) finance, i.e., meeting the requirements of increased personal and professional expenditures on a first-year teacher salary. Teachers identified finance as a major cause of family and personal stress. Teachers in Ohio can spend as much as $10,000.00 during their first two years of employment to obtain their teaching license.

Eskridge and Coker (1985) found certain professional variables stimulate teacher stress. For example, secondary teachers experience stress more frequently than elementary teachers. Also, the fewer years of professional preparation a teacher has increases the greater the likelihood of stress. However, age and gender are not significant when examining teacher stress (Milstein & Golaszewski, 1983).

The fewer number of years of professional teacher preparation impacts new teachers' abilities to successfully handle negative stress. Career-technical teacher licensure in Ohio has undergone major revisions since 1998, when the latest Ohio Department of Education Teacher Licensure standards went into effect (Ohio Department of Education, 1997). Ohio offers two routes to vocational teacher licensure. Route A allows students completing the traditional bachelor's degree in vocational teacher education to teach, while the alternative licensure, route B, is a 24-semester hour teacher education program for individuals entering teaching based on work experience. Career-technical teachers in Ohio can receive an initial two-year provisional teaching license and renew that license one time upon completion of 10 semester hours of teacher education. The teacher can obtain and their five-year professional license by completing the 24-semester hour teacher licensure program, passing the Praxis II and III examinations at an approved university that offers career-technical teacher education.

One of the unique features of Ohio career-technical education is that career-technical teachers are allowed to teach a class or program of study to secondary career center students as they spend two-years completing their initial teacher licensure requirements. Career-technical teachers have all of the classroom responsibilities of traditional academic teachers, as well as other employment obligations specific only to career-technical teachers. However, these career-technical teachers enter the classroom with little or no exposure to professional teacher preparation or student teaching. This fact alone almost assures that career-technical teachers will experience negative stress during their teaching assignment.

Career-technical teachers are required to complete the 24-semester hour licensure program even though they may have a bachelor's or master's degree in their occupational field. One area of stress frequently discussed by career-technical teachers is the amount of money, time, and travel involved in obtaining initial

teaching licensure. The career-technical teacher licensure program is offered at one state-supported university in southwestern Ohio. Many teachers must travel three to four hours roundtrip to attend class, in addition to attending a 3-hour class at the university. Career-technical teachers can spend nine to twelve hours weekly in obtaining their teaching license in addition to 35-40 clock hours per week teaching.

As part of the 24-semester hour program, career-technical teachers spend two to three weeks during the summer in licensure classes during their initial two years of teaching. Career-technical teachers also complete all State of Ohio-required Praxis I, II, and III examinations developed by the Educational Testing Service, in order to receive their professional five-year teaching license. Passage of the Praxis series tests, are considered a high stress situation.

Academic teachers usually complete their professional teacher preparation prior to accepting a full-time teaching assignment and have completed a field-based student teaching experience. Exposure to the classroom setting for academic teachers is an advantage a career-technical teacher hired from business and industry to teach high school students does not have. Career-technical teachers literally accept a teaching position, and in many cases, begin teaching without the benefit of a professional teacher preparation program, in-service, or mentoring environment. This environment for career-technical teachers can result in high levels of frustration, anxiety, and perceived negative stress, which can impact the individual's teaching performance or decision to remain in the teaching field.

## Significance

The significance of this study is found in the need to investigate the perceived differences between academic and career-technical teachers working in a career center regarding role stress, task stress, and environment stress. Teachers new to the profession express the impact that negative stress plays in their life. The ability to identify which group of teachers experiences greater stress can assist local school administrators and university teacher educators in addressing specific issues that cause the most stress. A second purpose of this study was to identify which of the three teacher stress factors—role, task, or environment—was selected by academic and career-technical teachers as having the most impact on the amount of perceived negative stress they experience during the school day.

The need for this study is supported in the literature surrounding teacher stress. Wiley (2000) identified important reasons for studying teacher stress; teachers who experience negative stress in their work can be impacted in numerous ways. Stress can have detrimental effects on the teacher's themselves, their students, and the learning environment. As a consequence of their stressful job conditions, many teachers are finding their feelings about themselves; their students, and their profession growing more negative over time. Increased negativity can ultimately result in teachers viewing their teaching career as a poor choice of professions, and teachers may seek a new career outside of education.

## Statement of Problem

Much of the recent literature concerning teacher stress has focused on teachers perceptions that their job is more stressful than comparable professions requiring a bachelors degree or higher (Litt & Turk, 1985). Being perceived as more stressful, teachers experience greater job dissatisfaction than found in other forms of employment. The most common types of stress found in career center schools revolve around teacher role, teacher task, and the school environment. Identification of the types of stress experienced, and who experiences greater amounts of stress, academic or career-technical teachers teaching in a career center, remains a topic of discussion between teachers and administrators.

The importance of answering the research questions is found in the problem of career-technical teachers leaving the teaching profession. If career-technical teachers experience excessive negative stress situations in teaching, they have the option of returning to their previous occupation. Academic teachers who experience negative job stress working at a career center may decide to leave the school and seek employment with another school district. A decision by academic teachers to remain at the career center, even if deemed a stressful place to work by academic teachers, might be made in order to receive higher wages and benefits typically offered by a career center school. However, academic teachers may not be effective in the classroom due to the negative stress they experience.

During discussions after survey administration, both academic and career-technical teachers explained the need for staff development to address their specific concerns regarding negative stress. Career-technical teachers stated that teacher preparation programs should provide increased knowledge about and provide coping strategies for working within a career center environment.

Among career center faculty, placement of students into career-technical programs who have exhibited high levels of disruptive behavior prior to entering the career center leads the list of reported stress related problems. Almost half of career-technical teachers indicated student motivation and maintaining career-technical program enrollments were also serious problems that produced negative stress (National Center for Educational Statistics, 1994).

Career-technical teachers argue that their teaching responsibilities and stress levels exceed that of traditional academic teachers. The statement is made based on the fact the career-technical teachers have the same classroom responsibilities as academic teachers, but career-technical teachers have additional liability issues, due to the nature of their occupational training laboratories. Other factors that increase career-technical teacher stress include recruiting and retaining students in their occupational programs, operating a co-curricular career-technical student organization, coordinating a career-technical advisory committee, finding and placing students in occupational specific job training programs, and coordinating the development of integrated technical and academic competencies (Adams, 1996).

## Method

This study sought to determine whether academic or career-technical teachers perceived greater role, task, and environment stress in a high school career center setting. The three stress variables—role stress, task stress, and environment stress—were defined by Pettegrew and Wolfe (1981). The research question was, Do differences exist between academic and career-technical teachers perceived role stress, task stress, and environmental stress in a career center as measured by the Teacher Stress Measure Instrument? Discussion with both academic and career-technical teachers were conducted after the initial data collection to identify additional issues surrounding perceived negative stress not identified by the study instrument.

Pettegrew and Wolfe (1981) conducted a validity study of several measures of teacher stress and developed the Teacher Stress Measure (TSM) consisting of thirteen different subcategories and 67 items. Items are scored on a 6-point Likert-rating scale. For the study, subsets of role stress (items 1-25), task stress (items 46-54), and environment stress (items 26-30) were specifically examined. Scoring the TSM instrument was accomplished by computing a mean score for each of the three stress sub-groups. The mean scores of the three stress variables were computed for both academic and career-technical teachers, and comparisons were made between the mean scores of each teacher group.

The stress measures of role, task, and environment were analyzed using both descriptive and inferential statistical tests. Statistical means, standard deviations, MANOVA and ANOVA were computed. The reliability of the questions for this study were measured by Cronbach's alpha: role ambiguity ($r$=.76), role conflict ($r$=.74), role overload ($r$=.77), role preparedness ($r$=.64), nonparticipation ($r$=.74), school-environment ($r$=.85), and task stress ($r$=.82).

Pettegrew and Wolfe's (1981) study of teacher stress measures also found the structural reliability and predictive validity associated with their subcategories to meet or exceed standards related to the constructs. Five subcategories—role ambiguity, role overload, role conflict, nonparticipation, and role preparedness—in the TSM were used as variables in this study to assess the dependent variable *role stress*. One category, *task stress*, was used to assess task stress. School stress was used to assess the dependent variable *school-environment stress*.

### *Limitations*

A descriptive design using non-random, quota sampling for data collection was employed for the study (Trochim 2000). The non-random quota sample is less optimal than a random sample. An additional limitation is a dependency on the Teacher Stress Measure (TSM) 67-item instrument. The study was only able to identify those factors defined by the items comprising the TSM. It is possible other factors regarding stress were missed in the survey data collection or analysis of data. Finally, the TSM is a self-reporting, paper-pencil survey instrument. The use

of teacher observations and teacher absence reports might have disclosed additional information concerning teacher role, task, and environment stress.

## *Participants*

Participants were academic and career-technical teachers employed by career center schools in Grades 11 and 12 in southwest Ohio. Twenty-four academic and 50 career-technical teachers agreed to participate, representing 84% of the eligible population. Participants were teachers with less than 4 years teaching experience, and had not obtained a Professional 5-year teaching license. Surveys were divided into separate groups for academic and career-technical teachers. Each survey was reviewed for completeness and the three subsets of role, task, and environment stress were identified on each survey. In addition to the Teacher Stress Measure Instrument, participants were asked to consider staying after the completion of the TSM, and meet with me to discuss their feelings surrounding the topic of teacher stress and answer a series of questions. The questions are listed in Table 1.

TABLE 1
*Participant Conversation Questions*

| |
|---|
| The following questions served as a starting point to focus participants on the subject of teacher stress: |
| 1.What activities or situations cause you to experience negative stress while teaching? |
| 2. Describe what activities or situations that cause you to experience negative stress while performing your role as a teacher? |
| 3. Describe what activities or situations that cause you to experience negative stress while performing your tasks as a teacher? |
| 4. Describe the school-environment that you work in, do you experience more or less negative stress than your previous employment? |
| 5. How would an outside observer know you are experiencing negative stress during the teaching day? |

Two groups of 10 teachers each, who had completed the Teacher Stress Measure agreed to participate in the discussions. I provided some basic definitions regarding role, task, and environment stress as defined by Pettegrew and Wolfe (1981). Discussions occurred in a classroom with participants only. No local school administrators or staff members were present. I collected consent forms prior to the start of the discussion. Both academic and career-technical teachers were present in the room as questions were asked and opened for discussion. I asked each question and allowed the group to provide open-ended responses and interrupted participants only when a point of clarification was needed. Additionally, a follow-up phone interview with 10% of the participants was conducted to discuss data analysis.

## Findings and Conclusions

Career-technical teachers reported greater role stress in a career center setting. Difference between academic and career-technical mean scores on role stress was statistically significant, (1,72)=3.74, *p*=.06. Career-technical teachers reported greater task stress in a career center setting. The difference in mean scores between academic and career-technical task stress is statistically significant, (1,72)=6.98, *p*=.01. Academic teachers reported greater school-environment stress. The mean scores between academic and career-technical teachers environment stress is not statistically significant environment stress (1,72)= 2.04, *p*=.16. Table 2 provides reported mean and standard deviation data.

TABLE 2
*Means and Standard Deviations for Academic and Career-Technical Teachers Role/Task/Environment Stress*

| | Academic (*n*=24) | | Career–technical (*n*=50) | |
|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* |
| Role stress | 2.75 | .60 | 2.98 | .41 |
| Task stress | 3.19 | .50 | 3.55 | .57 |
| Environment stress | 3.52 | .67 | 3.31 | .55 |

Comparing academic and career-technical teachers as a whole, academic teachers experienced less role stress than career-technical teachers, but greater role stress than teachers in Pettegrew and Wolfe's (1981) study. Academic teachers had less task stress than career-technical teachers and less task stress than teachers in Pettegrew and Wolfe's study. Academic teachers experience greater environment stress than do career-technical teachers but less environment stress than teachers in the Pettegrew and Wolfe study. Pettegrew and Wolfe's study is now 20+ years old, and some stress factors may have changed in schools.

## Recommendations

Beginning with the guiding thought that perceived negative stress experienced by new teachers might cause increased attrition of new teachers from the teaching profession, I sought to identify and clarify the issues of stress in career centers. Based on my findings with academic and career-technical teachers, several positive outcomes are possible. With the knowledge that career-technical teachers report higher levels of role and task stress, specific changes to the career-technical teacher licensure program can be made. Schools of education that offer career-technical licensure programs can now examine what factors cause the most stress for career-technical teachers new to the teaching profession.

Issues surrounding specific role and task stress issues need to be addressed in the career-technical teacher education program. School environment issues need to be addressed by career center administrators. A second implication from the study

is the identification of stress issues that exists inside the career center school district. The career center school district can now attempt to design a professional teacher staff development program agenda to address the individual and collective needs of its teaching faculties.

Career center administrators and staff development committees need to assist new teachers with clarifying their teacher responsibilities, to include better understanding of the teacher evaluation process. Career center administrators need to be made aware of the time and money expenditures that new career-technical teachers make in order to obtain their initial teaching license. Career center administrators need to monitor the stress levels being experienced by the new teacher, and offer support, encouragement, and peer group discussion as a means to deescalate academic and career-technical teachers stress. It is hoped career center administrators will create mentoring programs for new teachers to lessen the negative stress issues associated with being a new teacher.

Replication should occur across the state of Ohio to determine if other career-technical and academic teachers uniformly agree with the results of this study. Schools of education have a starting point to address teacher stress and can collaborate together on the best way in which to reduce stress for either academic or career-technical teachers. Suggestions for further research include a continued analysis of teacher stress issues associated with teaching in a high school career center setting. Identification of different stress variables will also be of great assistance for future study. I also suggest a program of study be developed for use in pre-service teacher training programs at schools of education to lessen the effects of stress, or provide new teachers with coping strategies that will allow them to recognize negative stress, and find ways in which to relieve the stress. Finally, future research should examine teacher stress longitudinally, conducted in various parts of the U.S. The study would identify teacher stress issues, identify successful programs created to alleviate teacher stress and disseminate the information for use at all levels and delivery systems of teaching.

I recommend that career-technical teacher preparation programs implement strategies and techniques to address role and task stress factors. Traditional academic teacher preparation programs need to incorporate additional information and teaching strategies for their students who teach in diverse employment settings, such as career centers and urban school districts. Academic teachers experiencing stress will need initial support during their student teaching process and will need professional teacher in-service training to address the on-going stress issues associated with teaching at a career center.

## References

Adams, E. (1996). The effects of school systems, teacher internal characteristics, and students on vocational teacher stress (Doctoral Dissertation, University of Virginia, 1996). *UMI Dissertation Services, UMI number 9626113*.

Camp, W. G. (2001). Formulating and evaluating theoretical frameworks for career and technical education research. *Journal of Vocational Education Research, 26*(1), 4-25.

Eskridge, D. H., & Coker, D. R. (1985). *Teacher stress: Symptoms, causes, and management techniques*. (ERIC Document Reproduction Service No. EJ 320 930)

Fimian, M. J., & Fastenau, P. S. (1990). The validity and reliability of the teacher stress inventory: A re-analysis of aggregate data. *Journal of Organizational Behavior, 11,* 151-157.

Litt, M. D., & Turk, D. C. (1985). *Sources of stress and dissatisfaction in experienced high school* teachers. (ERIC Document Reproduction Service No. EJ 320 930)

Milstein, M. M., & Golaszewski, T. J. (1983). *Organizationally-based stress: What bothers teachers (an end of year perspective)?* Montreal, Quebec, Canada: America Education Research Association. ERIC Document Reproduction Service No. ED 231 048)

National Center for Educational Statistics. (1994). *Public secondary school teacher survey on vocational education* (NCES/FRSS Publication NCES No. 94-409). Washington, DC: U.S. Government Printing Office.

Norton, M. S. (1999). Teacher retention: reducing costly teacher turnover. *Contemporary Education, 70*(3), 52-55.

Ohio Department of Education. (1997). *Teacher education and licensure standards* (State of Ohio Publication; Administrative Code 3301-24). Columbus, OH: Author.

Pettegrew, L. S., & Wolfe, G. E. (1981). *Validating measures of teacher stress.* Nashville, TN: Vanderbilt University, George Peabody College. (ERIC Document Reproduction Service No. ED 213 743)

Prince, H. T. (1988). The leader as stress manager. In J. Abrams, D. Puglisi, & J. Balla (Eds.), *Leadership in organizations* (pp. 323-340). New York: Avery.

Trochim, W. M. (2000, August 2) *The research methods knowledge base* (2nd ed.). Retrieved August 4, 2001 from http://trochim.human.cornell.edu/kb/ index.htm

Wiley, C. (2000). *A synthesis of research on the causes, effects, and reduction strategies of teacher stress*

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*Journal of Vocational Education Research, 27(3), pp. 319-329.*


# Instructional Technology Competencies Perceived as Needed by Vocational Teachers In Ohio And Taiwan

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## Abstract

*This study explored and described the perceptions of vocational and career-technical education teachers for the knowledge, importance, and educational needs of instructional technology and compared perceptions of teachers in Ohio and Taiwan. All vocational education teachers working at 44 comprehensive high schools and six Joint Vocational Schools (JVS) in the central region of Ohio and 22 vocational high schools in Kaohsiung district, Taiwan during 2001-02 academic years participated. The Borich needs assessment model was adapted to determine the need for instructional technology knowledge and skills. A questionnaire was designed to gather information about vocational teachers' school and program characteristics and their perceptions of the instructional technology importance and knowledge in their program. The questionnaire was developed in both English and Mandarin Chinese.*

Changes in the workplace require continual professional development as a means of skill upgrading, even for teachers with degree in education. New ways of teaching and learning are requiring teachers to assume the roles of coach and facilitator and to situate student learning in real-world contexts. Teachers must be able to use new technologies, which continually changing roles and responsibilities, teachers need an effective professional development plan that can help them keep current and embrace new ways to improve their practice.

Instructional technology is used to manage and instruct in vocational and career-technical education and encompasses not only the computer but also other technologies and delivery systems. The career preparation of teachers, internationally, is impacted by their opportunities and decisions regarding their use of technology and is often contingent on their level of instructional technology knowledge and skill. As Sormumen and Chalupa (1994) noted, a U. S. Office of Technology report maintained that the use of technology could not be fully effective unless teachers receive adequate training and support. Due to the rapid changes in technology and reduced funds, instructional technology competencies' training for teachers is limited. Teachers need instructional technology competencies so they can teach these competencies to students for their entry-level job requirement.

Cross-cultural studies on instructional technology in education have gained considerable attention. The findings of cross-cultural studies provided information

leading to better understanding of teachers' perceptions of instructional technology competencies across countries and identified some universal variables related to teachers' perceptions of instructional technology. This comparison study between Ohio and Taiwan also will provide information of each nation's circumstances in educational needs of instructional technology competencies. The information was the resources worldwide in teacher education for references of future research.

### *Purpose and Objectives*

The purpose of this study was to explore and describe the perception of the knowledge, importance, and educational needs of instructional technology for vocational and career-technical education teachers and draw comparisons between Ohio and Taiwan. Objectives for this study were to determine (1) the demographic characteristics of vocational teachers such as age, gender, highest degree earned, instructional technology experience, and specialty, (2) the perceived knowledge of instructional technology competencies possessed by teachers, (3) the perceived importance of competencies for instructional technology vocational teachers in Ohio and Taiwan, (4) the perceived need for further education in instructional technology by vocational teachers in Ohio and Taiwan, and (5) the relationships among demographic characteristics of teachers and their instructional technology education needs.

### *Literature Review*

Instructional technology is the great enabler and provides, for those who have access to it, extends powers of perception, comprehension, analysis, thought, concentration, and articulation through a range of activities that include: writing, visual images, mathematics, music, physical movement, sensing the environment, simulation, and communication (Carpenter, 1989). Instructional technology, in all of its various forms, offers users the tools to access, manipulate, transform, evaluate, use, and present information. Instructional technology in schools includes computers, televisions, video cameras, video editing equipment, and TV studios. According to some empirical indication, students who use technology as a tool may become better at managing information, communicating, and presenting ideas (Plotnick, 1999).

Early computer technology initiatives in schools were essentially technology centered. As Anderson et al. (1979) noted the principle seemed to be that "as long as the facilities are available and teachers are trained in computing, adoption… is inevitable" (p. 229). But it soon became evident that access to hardware and software alone were insufficient to ensure successful uptake of Informational Technology (IT) in schools. Learning how to use IT in the classroom requires pedagogic understanding of what computer assisted learning applications are trying to do and of what the hardware and software are capable of doing. In consequence, later initiatives of IT tended to focus on pedagogic rather than technical concerns.

Many professional organizations have incorporated instructional technology into their professional standards (Abramson, 1993). In 1989, the International Society for Technology in Education (ISTE) formed an alliance with the National Council for Accreditation of Teacher Education (NCATE) and established guidelines for

technology competencies for all teacher education programs. ISTE developed standards for instructional technology competencies including: (1) the use of computer-based technologies to access information to enhance personal and professional productivity, and (2) application of computers and related technologies to facilitate emerging roles of the learner and the educator (Thomas, 1993). NCATE (2000) proposed that pedagogical studies of teachers should include knowledge and appropriate experiences with educational computing, including the use of computer and related technologies in instruction, assessment, and professional productivity.

For vocational and technical education, Perkins II legislation and national and state reports addressing reform imply that a teacher must be prepared to use computers and technology throughout the instructional program. Furthermore, Perkins III legislation focuses the Federal investment on high-quality programs in developing, improving and expanding the use of technology to provide professional development for teachers.

Students are confronted by more information than they can possibly assimilate and are overwhelmed by the need to learn the mechanics of locating information. To develop the student's capacity to recognize his or her need for information, and the ability to locate, evaluate, and use it becomes essential. Teachers must work in partnership with each other to articulate what students should know in regard to instructional technology competencies that pose an enormous challenge as a resource to the teacher because the use of computer technology may be changing the way teaching is conducted (Sheingold & Hadley, 1990). The fundamental change required to use computers for teaching is to affect teachers' existing conceptions of the teaching and learning process and to their conceptions of their pedagogic role.

## Method

This study employed a descriptive survey. The difficulties of using this research design are (a) the degree of clarity of questions, (b) getting respondents to answer questions thoughtfully and honestly, and (c) receiving a sufficient number of questionnaires back (Salant & Dillman, 1994). An advantage of survey research is the potential to receive a great deal of information from a large group of individuals. To successfully implement a survey study, an understanding and avaoidance of major errors is crucial. Major errors of the survey method are briefly described below.

*Frame error.* According to Groves (1989), frame error occurs when the frame or survey population from which a sample is drawn does not include all elements of the population. A discrepancy between intended target population and actual survey population results in frame error. For this study, frame error was controlled by ensuring that the most accurate list was secured from the Ohio Department of Education and Department of Technical and Vocational Education in Taiwan.

*Sampling error.* Sampling error occurs when a non-random subset or sample of all people in the population is used instead of conducting a census (Salant & Dillman, 1994), and can be controlled by increasing sample size and using a random sampling procedure. Because sampling error can be estimated, it is often the only specific error referred to when survey results are presented.

*Selection error.* Selection error is a type of external validity threat resulting from duplicate entries in a frame, and occurs when certain sampling units in the population have a greater or lesser chance of being selected than other sampling units (Salant & Dillman, 1994). Selection error was controlled by checking the lists to ensure that there was no duplication of names in this study.

*Non-response error.* Non-response error is the most problematic error in survey research, and occurs when people in the sample do not respond to the questionnaire and are different from those who do respond in ways considered important to the study (Salant & Dillman, 1994). We used a code number on each questionnaire to allow us to identify nonrespondents for follow-up purposes. The *double-dip* technique was used to control for nonresponse error by drawing a random sample (10-20%) from all nonrespondents to get their response by phone interview. These results allowed us to compare respondents with nonrespondents. If no difference exists, data can be collapsed. However, if responses are different, a proportionately weighted formula is calculated to adjust the data (Ary, Jacobs, & Razavieh, 1990; Miller & Smith, 1983).

*Measurement error.* Measurement error occurs during data collection and can result from four sources that include the survey method, questionnaire, interviewer, and respondent. Measurement error occurs when a respondent's answer to a given question is inaccurate, imprecise, or cannot be compared in any useful way to other respondents' answers (Salant & Dillman, 1994).

According to Ary et al. (1990) and Fraenkel and Wallen (1996), the purposes of correlational research are to (a) describe relationships that exist among variables, and (b) use the known correlation to predict from one variable to another. We were concerned with determining the relationships among the demographic characteristics of teachers and their instructional technology education needs, as well as using data to help explain and predict perceived instructional technology competencies by vocational education teachers in Ohio and Taiwan.

### *Population and Sample*

The populations of this study consisted of all vocational education teachers working at 44 comprehensive high schools and six joint vocational school districts (JVSD) in the Central Region of Ohio and 10 teachers per 22 vocational high schools in Taiwan. Considering the size of Ohio and Taiwan and the practical constraints in gathering data from the total populations of vocational teachers, the accessible populations for this exploratory study were chosen as secondary vocational teachers in the Central Region of Ohio and Kaohsiung District (included Kaohsiung City and Kaohsiung County) of Taiwan during the 2001-02 academic year.

All 44 comprehensive high schools and six JVS were identified from a list published by the Division of Career-Technical and Adult Education, Ohio Department of Education, and Department of Technical and Vocational Education in Taiwan (n=22). The researcher selected all qualified vocational teachers (N=247) in central Ohio and randomly selected 10 teachers per school in Taiwan (n=220) by using a 2000-2001 directory that listed all vocational education teachers at schools in Ohio and

Taiwan. Generalizations can be made only to the secondary schools located in the Central Region of Ohio and Kaohsiung District of Taiwan. Those schools that were not part of the accessible population may differ, thus, causing potential error if generalizations were they to be extended to other schools.

### *Instrumentation*

The Borich (1980) needs assessment model was adapted to determine the need of instructional technology knowledge and skills for secondary vocational teachers. A questionnaire was designed to gather information about secondary vocational teachers' school and program characteristics and their perceptions of the instructional technology importance and knowledge in their programs. The questionnaire was developed with two parallel versions: (1) English version used for the Central Region of Ohio; (2) Mandarin version using for Kaohsiung District of Taiwan.

The suitability and clarity of the instrument were assessed through a field test with 15 Ohio vocational teachers enrolled in the CAREERTECH e-mail list (*careertech@ lists.acs.ohio-state.edu*) email list that was established by the National Dissemination Center for Career and Technical Education for question-and-answer service. Internal consistency reliability was assessed using a pilot test of 15 vocational teachers in an area close to the central region of Ohio using Cronbach's alpha. A useful standard is that the coefficient of reliability should be at least .50 to .60 and preferably higher (Nunnally, 1967). Cronbach's alpha reliability on educational needs and coefficients of the instrument ranged from .67 to .98.

## Findings

The first objective was to describe the demographic characteristics of Ohio and Taiwan vocational teachers. In Ohio, around one-quarter of the respondents had 6 to 10 years of teaching experience, while the most prevalent age group of respondents was 41-50 years (41.8%), followed by the 51-60 year age group (21.4%). Forty-seven percent were male and the most common academic degree held was a bachelor's degree (46.2%), followed by a master degree (29.7%). The primary curricula taught during the 2001-2002 school year was in the category of business and management (42.9%) followed by industrial and engineering systems (25.8%), and environmental and agriculture systems (14.3%). Curricula of other programs included human resources and services (6.6%), art and communication (5.5%), and health services (4.9%).

In Taiwan, 26 percent of the respondents had five or less years teaching experience, while the prevalent age group was 31-40 years (39.3%), followed by the 41-50 years-old group (34%). Forty-five percent of respondents were male and the most common academic degree held was a bachelor's degree (82.7%). The main curricula taught during the 2001-2002 school year was in the category of industrial and engineering systems (31.4%), business and management (23%), marine science (14.1%), and human resources and services (11%). Other programs included health services (7.9%), art and communication (7.9%), and environmental and agriculture systems (4.7%).

Objectives 2, 3, and 4 sought to describe the perceived competence, importance, and educational needs of instructional technology competencies possessed by vocational

teachers in Ohio and Taiwan using the Borich Needs Assessment Model. For Ohio vocational teachers, the top three perceived competencies were insert and eject floppy disk and CD-ROM; start up and shut down the computer according to computer type; and save a document using both the save and save as commands. The top three perceived competencies were in the category of computer operation skills. The least perceived competencies were effective use of distance learning desktop video conferencing, tele-teaching technologies, and how to use FTP to send or retrieve files from remote computers.

The perceived importance levels of competencies for Ohio vocational teachers were check spelling, grammar, and word usage in word process; identify and use icons, windows, and menus; and enter and edit text in word process. Using FTP to send or retrieve files from remote computers and using Gopher to browse resources on the Internet were the two least perceived importance levels of competencies.

The top three perceived competence levels for Taiwan participants included insert and eject floppy disk and CD-ROM; start up and shut down the computer according to computer type; and copy and move block of text in word process. The least perceived competencies were how to connect a video output device (LCD panel or LCD projector) to computer for large screen display and how to use camcorder and edit video from a camcorder in media communications category.

Analysis of 86 competencies for Taiwan vocational teachers placed high levels of perceived importance on protecting against computer viruses; naming a document; and copying and moving blocks of text in word processing. The least importance competencies included check spelling, grammar, and work usage in word processing and set up and operate a videocassette recorder/player and monitor/TV in the media communications category.

In Ohio, the top five instructional technology competency needs included protect against computer viruses; create custom layouts including columnar reports in database; insert database fields into word processing document; effective use of distance learning desktop video conferencing, and tele-teaching technologies; and create a graph or chart from spreadsheet data. In Taiwan, the top five perceived needs included: protect against computer viruses; use digital document camera for 3-D objects as well as documents and slides presentation; produce a video; connect a video output device to computer for large screen display; and use camcorder and edit video from a camcorder. For both Ohio and Taiwan participants, the lowest instructional technology competency needs were located in the category of computer operation skills.

Objective 5 described the relationships among the demographic characteristics of teachers and their instructional technology educational needs. The correlation coefficients among eight areas of instructional technology educational needs were negligible or low in both Ohio and Taiwan according to Davis's (1971) conventions for describing measures of association. Seven of the top 15 competencies were the same for Ohio and Taiwan vocational teachers including:

1. protect against computer viruses
2. effective use of distance learning desktop video conferencing, and tele-teaching technologies

3. insert database fields into word processing document
4. use File Transfer Protocol (FTP) to send or retrieve files from remote computers
5. create a database with multiple fields
6. create custom layouts for database including columnar reports
7. use a database to sort records.

## Conclusions and Implications

The following conclusions and implications were drawn and are applicable only to this sample. More than 70% of Ohio vocational teachers had a bachelor's degree or higher and 16% had an associate degree or less. About 95% of the Taiwan vocational teachers had a bachelor's degree or higher. Thus, academic preparation of vocational education teachers was fairly high, especially for the Taiwan vocational teachers.

Approximately 50 percent of Ohio and Taiwan vocational teachers had 10 years or more of teaching experience at their present school. In fact, more than one-half of teachers were fairly experienced leading us to assume that they were somewhat familiar with instructional technology technique and materials.

Surprisingly, we had an even distribution of male and female respondents. We expected a greater proportion of female teachers compared to males. Therefore, we obtained a gender-balanced perspective of participation in instructional technology competencies needs. For teachers in Ohio ($n$ = 182), 67% were 41 years of age or more. Thus, we also had a mature teaching faculty who should have more interest in learning about instructional technology and its applications. However, the average age of Taiwan vocational teachers (38 years old) were slightly younger than Ohio teachers (43years of age).

When looking at both Ohio and Taiwan vocational teachers' specialties, the predominant teaching fields were in business and management, and industrial and engineering systems. For Ohio teachers, 43% had a specialty in business and management follow by industrial and engineering systems (26%). Around 31% of the Taiwan teachers taught in industrial and engineering systems and 23% in business and management. Thus, both Ohio and Taiwan vocational teachers were in the same major clusters of career fields.

When exploring the instructional technology experience of vocational teachers, 24% of the Ohio vocational teachers had not attended any instructional technology training or workshop. About 32% had 6-10 hours of some kind of instructional technology training. Surprisingly, nearly 42% of the Taiwan vocational teacher had not had any instructional technology training experience.

### *Conclusions*

The average Ohio vocational education teacher was either a male or female, with a bachelor's or higher degree, taught in business or engineering and had more than 10 years of teaching experience. The average Taiwan vocational teacher was either a male or female, with a bachelor's or higher degree, taught in business or engineering, had

more than 10 years of teaching experience and more than 40% of them were without instructional technology training experience.

*Instructional technology competencies.* The difference in mean scores for educational needs (the perceived importance score subtract the perceived competence score, and then multiply the result by the average perceived importance score) was calculated for Ohio and Taiwan vocational education teachers in each instructional technology competence areas. Participants in this study perceived a considerable amount of competence about computer operation skills. The findings show that computer operation skills were not a major educational priority for the vocational teachers in both Ohio and Taiwan. The lower educational needs scores in this area may imply that the teachers already have received information, have been self-taught, and/or have participated in computer literacy training or workshops. Information about creating and name/rename subdirectories/folders and starting an application and creating a document in the area of computer operation skills were vocational teachers' most important educational needs in computer operation skills. The fact that the rapid spread of computers and computer-based technologies has had a huge impact on Ohio teachers since Perkins II and III legislation implied computer literacy for teachers for a long time. Therefore, computer operation skills were not a major educational priority for the teachers.

Results confirmed that vocational teachers' competence for protecting against computer viruses in setup, maintenance, and troubleshooting of computer system area was low. In this area, both Ohio and Taiwan vocational teachers reported protecting against computer viruses as the number one educational need among the 86 competencies. The reason could be that infestation with a computer virus is unpredictable and uncontrollable.

Seven items among the top 15 ranked very high in educational needs among Ohio and Taiwan vocational teachers and could be summarized in one of two categories, database or telecommunications. Database, as a data management program, can be very useful for teachers in keeping attendance records and/or recording grades, generating printed progress reports, sorting and locating particular records by category, importing records or merging files, and communication with district resources for class registration. Telecommunications, such as using an Internet web-browser to locate web sites, using an appropriate search tools to find accurate information for a specific topic, using e-mail to send, receive, reply and forward messages, using conferencing tools to chat with or interview a colleague online, and creating web pages; were a booming and useful technology tool for any educational settings. Educational courses, formal or informal, should be planned that meet the most important identified needs of the vocational teachers in Ohio and Taiwan.

We ranked educational needs for each item under the eight-domain areas. This information can help the Ohio Education Department and Ministry of Education of Taiwan in prioritizing instructional technology educational programs on the items that were ranked high. Target planning will help meet the needs of vocational teachers, attract a wider array of teachers, and lead to the success of instructional technology educational programs. Educational courses should be planned that meet the identified needs of vocational teachers, with emphasis given to those needs ranked highest.

For both Ohio and Taiwan vocational teachers, the lowest instructional technology educational need was computer operation skills with average mean score .37 (on a 5-point scale). Protecting against computer viruses was the most important educational need for both Ohio and Taiwan vocational teachers. Database and telecommunications, among the eight-domain areas, were the top two instructional technology educational needs for both Ohio and Taiwan vocational teachers.

*Relationship between demographic characteristics and instructional technology needs.* The relationship among selected demographic characteristics and educational needs were either low or negligible. Findings appear to indicate that both Ohio and Taiwan participants have similar educational needs. Therefore, the instructional technology training program based on the educational scores will service the various groups of vocational teachers, regardless of their demographic characteristics.

The relationship between teachers' education degree held, instructional technology training experience and educational needs had a negligible to low relationship. Similar characteristics may account for the lack of association. A negative coefficient means that the predicted value of the dependent variable (educational needs) decreased when the value of the independent variable (teachers' education degree held) increases. Vocational teachers with higher degrees had lower educational needs; had more instructional technology training experience and had lower educational needs. Instructional technology competencies need to be constantly practiced and updated as new technology emerges (Huang & Padron, 1997; Liao, 1993, 1995; Redmann, 1998). Age, gender, year of teaching, and teaching specialty had low to negligible association with educational needs. Teachers' degree held and instructional technology training experience had negligible to low association with educational needs.

## *Recommendations*

*Recommendations for vocational education practice.* Formal education opportunities (courses, workshops, seminars) should update vocational teachers' instructional technology knowledge and skills on a consistent basis. Teachers should take advantage of opportunities when offered. If available offerings do not meet the needs of vocational teachers, they should assume their professional responsibility by being proactive in communicating this to appropriate service providers.

The Ohio Department of Education and the Ministry of Education in Taiwan, college/university teacher education programs, professional associations, and other service providers should place a high priority on increasing the instructional technology knowledge and skill levels of vocational teachers.

New instructional technology and applications are created almost daily. Results of this study indicate that setup, maintenance, and troubleshooting of computer system and database were the important priorities for Ohio vocational teachers, while telecommunications was an important priority for Taiwan vocational teachers. New information about instructional technology and applications such as maintenance and troubleshooting of computer system, database, and telecommunications should be provided periodically as an education training or workshop for teachers.

*Recommendations for theory.* Studies based on the discrepancies analysis of Borich Need Assessment Model to determine accurate measurements of the differences between perceived competence and importance of instructional technology competencies to find out perceived instructional technology educational needs for teachers should be conducted.

The International Society for Technology in Education (ISTE) standards for instructional technology competencies—including use of computer-based technologies to access information to enhance personal and professional productivity, and application of computer and related technologies to facilitate emerging roles of learner and educator—should serve as references of instructional technology competencies.

*Recommendations for further research.* The findings of the instructional technology educational needs of vocational teachers should be used to explore how vocational teachers use these instructional technology competencies in the classroom or in other professional activities for further research.

The relationships among selected demographic characteristics and educational needs were negligible to low. Therefore, further studies should analyze the relationship of other selected demographic characteristics and educational needs in other states and countries in order to verify if there are differences or common patterns in findings.

Cross-national studies have provided information leading to better understanding of teacher's perceptions of instructional technology competencies across countries and identified some universal variables related to vocational teachers' perceptions of instructional technologies and applications. Further research should include other countries for comparison.

Most of the studies (Uko, 1985; Arede, 1994; Layfield & Dobbins, 2000) that used Borich's model had very low correlation coefficients among needs and characteristics. Similar studies should explore other variables, such as types of computer currently using, effectiveness of the use of computer in the instructional process, and ethnicity.

Advanced instructional technology competencies for professional development such as (1) integrate teaching methodologies with knowledge about use of technology to support teaching and learning, and (2) exhibit leadership in the identification, selection, installation, maintenance, and management of computing hardware and software and the uses of computer and related technologies throughout the curriculum should be researched further. This investigation should be replicated at other points in time.

## References

Abramson, G. W. (1993). Technology and teacher education accreditation process. *ED-Tech Review, 1,* 27-30.

Anderson, R., Hansen, T., Johnson, D., & Klassen, D. (1979). Instructional computing: Acceptance and rejection by secondary school teachers. *Sociology of Work and Occupations, 6*(2), 227-250.

Ary, D., Jacobs, L. C., & Razavieh, A. (1990). *Introduction to research in education* (3rd ed.). New York: Holt, Rinehart and Winston.

Borich, G. D. (1980). A needs assessment model for conducting follow-up studies. *Journal of Teacher Education, 31*(3), 39-42.

Carpenter, J. P. (1989). *Using the new technologies to create links between schools throughout the world: Colloquy on computerized school links*. Devon, UK: University of Exeter, Author.

Fraenkel, J. R., & Wallen, N. E. (1996). *How to design and evaluate research in education* (3rd ed.). New York: McGraw Hill.

Gray, L. R. (1987). *Competencies for analysis and application.* New York: Macmilliam.

Groves, R. M. (1989). *Survey errors and survey costs*. New York: John Wiley & Sons.

International Society for Technology in Education, Accreditation Committee (1992). *Curriculum guidelines for accreditation of educational computing and technology programs.* Eugene, OR: Author.

Kerlinger, F. K. (1979). *Behavioral research: A conceptual approach.* New York: Holt, Rinehart, and Winston.

Miller, L. (1998). *Research methods course syllabus and lecture notes* [Agriculture Education 885]. (pp. 59-65) Columbus: The Ohio State University, Department of Human and Community Resource Development.

Miller, L., & Smith, K. (1983). Handling non-response issues. *Journal of Extension, 21,* 45-50.

National Council for Accreditation of Teacher Education. (2000). *Proposed refinement of NCATE's standards for the accreditation of professional education units.* Washington, DC: Author.

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.

Plotnick, E. (1999). *Information literacy*. Syracuse, NY: ERIC Clearinghouse on Information and Technology. (ERIC Document Reproduction Service No. ED 427 777)

Salant, P., & Dillman, D. A. (1994). *How to conduct your own survey*. Canada: John Wiley & Sons.

Sormunen, C., & Chalupa, M. (1994). Perceived pre-service and in-service technology training needs of Indiana business teachers. *The Delta Pi Epsilon Journal, 36*(1), 14-23.

Thomas, L. (1993). *Curriculum guidelines for accreditation of education computing and technology programs* (2nd ed.). Eugene, OR: International Society for Technology in Education.

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*Journal of Vocational Education Research, 27(3), pp. 331-341.*


# Novice Teachers' Perceptions of Support, Teacher Preparation Quality, and Student Teaching Experience Related to Teacher Efficacy

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## Abstract

*This multiple regression study analyzed the percent of variance in teacher efficacy of 106 student teachers and novice teachers in agricultural education in Ohio explained by selected variables related to perceived support (utilizing a mentor, supportive principal behaviors, collective efficacy), teacher preparation quality, and student teaching experiences. Collective efficacy, perceived teacher preparation quality, and perceived student teaching experience explained 17% of the variance in teaching efficacy at the 10th week of the school year. Although utilizing a mentor and supportive principal behaviors were eliminated from the model, perhaps these variables were not perceived as being as important as collective efficacy, perceived teacher preparation quality, and perceived student teaching experience during the first 10 weeks of the school year.*

The beginning years of teaching can be very challenging. Novice teachers who exhibit a higher sense of efficacy are more likely to persist and remain in the profession. Education, experience, and support can help novice teachers feel more efficacious and be more effective teachers. Teachers are the single most important variable related to student achievement (Darling-Hammond, 1997) and their expertise and beliefs influence the success of an agricultural education program (Anderson, 1977). Therefore, a teacher's beliefs, attitude, and disposition of being a confident, efficacious teacher needs further investigation in preparing teachers in agricultural, career, and technical education.

Nationally, there is a 75% attrition rate along the pipeline from the beginning of undergraduate teacher education through about the third year of teaching (National Commission on Teaching and America's Future, 1996) and 17% of new public school teachers leave the profession within the first three years (U.S. Department of Education, 1997). Working conditions, including professional autonomy, poor student motivation, student discipline problems, and lack of recognition and support from administration, play an important role in determining who stays in teaching (Darling-Hammond, 1997; U.S. Department of Education). Mundt (1991) found that novice agriculture teachers lacked confidence and expressed feelings of loneliness, isolation, frustration, and stress.

Teacher efficacy is a belief concept of teacher motivation, which served as the theoretical base of the study. Tschannen-Moran, Woolfolk Hoy, and Hoy (1998) defined teacher efficacy as "the teacher's belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context" (p. 233). Teacher beliefs play a critical role in the development of teachers (Smylie, 1998) because they filter the perception and interpretation of new knowledge and phenomena, which influences how teachers learn to teach, plan to teach, make instructional decisions, and interact with students (Borko & Putnam, 1996; Richardson & Placier, 2001).

Motivated and confident agriculture teachers were more effective teachers (Miller, Kahler, & Rhealt, 1991) and are more likely to display a disposition that all students can learn (Darling-Hammond, 1999; NCATE, 2001). Students achieved more, were more motivated, and had a greater sense of efficacy when their teachers had higher teacher efficacy (Ashton & Webb, 1986; Guskey & Passaro, 1994). Moreover, teacher efficacy was related to teachers' behavior, effort, innovation, planning and organization, persistence, resilience, enthusiasm, willingness to work with difficult students, and commitment to teaching and their careers (Tschannen-Moran et al., 1998).

The conceptual framework of this study is based on the premise that agricultural education teachers who are more confident and efficacious in their teaching, will be more motivated, be more effective in helping students learn, be more persistent in difficult situations, and remain longer in the teaching profession than their counterparts who lack confidence and exhibit low teacher efficacy. However, teacher educators need to know which factors influence teacher efficacy, especially during the early years of teachers' development (Tschannen-Moran et al., 1998).

In a qualitative study of student teacher and novice teachers in agricultural education, Knobloch and Whittington (2002) concluded that ten factors influenced novice teachers' efficacy: (a) support and feedback; (b) knowledge and education; (c) teaching and student teaching experience; (d) positive interactions with students; (e) preparation, anticipation, and expectations; (f) resources and facilities; (g) personal background; (h) intrinsic motivation; (i) isolation, overwhelmed, and helplessness; and, (j) other factors such as school procedures, paperwork, workload, and unrealistic expectations. Novice teachers felt more efficacious and confident if they received positive feedback, support, guidance, and encouragement from students, teachers, administrators, parents, and community members. Although there can be various means of support and feedback, selected variables of having a mentor, collective efficacy, and principal support appear to be related to teacher efficacy.

Novice career and technical education teachers expressed that personal support from other educational professional in the form of a mentor or peer support group was key to staying in the teaching profession (Ruhland & Bremer, 2002). Many educational professionals suggest that mentoring has positive impacts on novice

teachers (Feiman-Nemser, 1996; Holloway, 2001; Joerger & Bremer, 2001). Mentors helped novice teachers face new challenges (Danielson, 1999) and make situational adjustments to teaching (Feiman-Nemser, 1992). Moreover, mentors may reduce attrition among first-year teachers (Ruhland & Bremer). However, research findings are mixed on whether mentors help novice teachers improve their performances (Feiman-Nemser). The presence of mentors does not in and of itself guarantee that novice teachers will become better teachers than if they did not have mentors (NCRTL, n.d.*)*. More importantly, mentor and novice teacher relationships have mutual benefits because learning occurs collaboratively through experimentation within a professional community (Awayaa, McEwana, Heylerb, Linskyc, Lumd, & Wakukawa, 2003; Feiman-Nemser, 1992).

Therefore, mentoring appears to depend on how supportive mentors are to novice teachers. Mentors provide two types of support: (a) emotional support for affect development; and, (b) professional support for cognitive development of teaching (Little, 1990). Novice agriculture teachers needed principal support (Mundt, 1991), perceived that principal support had impact on their success as a teacher (Joerger & Boettcher, 2000), had no support from other teachers (Talbert, Camp, & Heath-Camp, 1994), and perceived that building the support of faculty, counselors, and administrators within the school system as an important problem and challenge (Mundt & Connors, 1999). The impact of collegial teacher and principal support on teacher efficacy is imperative. Collective efficacy and teachers helping other teachers influenced teacher efficacy (Goddard & Goddard, 2001; Goddard, Hoy, & Woolfolk Hoy, 2000; Newmann, Rutter, & Smith, 1989; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Principal and administrator behaviors influenced teacher efficacy (Hoy & Woolfolk, 1993; Newmann, Rutter, & Smith, 1989).

Novice teacher who had technical, professional, and pedagogical knowledge and were prepared to teach through technical agriculture and teacher education courses felt more efficacious (Knobloch & Whittington, 2002). Darling-Hammond's (1999) identified that several variables that were indicative of teachers' competence among which were subject matter knowledge and knowledge of teaching and learning. Indeed, teacher education programs play a significant role in developing teachers (American Council on Education, 1999; McGhee & Cheek, 1990).

Novice teachers also felt that teaching and student teaching experience made them feel more confident, whereas, the lack of teaching experience made them feel less confident (Knobloch & Whittington, 2002). Commonly, the adage, "experience is the best teacher," seems to fit for novice teachers because it combines technical knowledge and practical judgment into application (Field & Macintyre Latta, 2001). Experience may increase a person's automatic skill in a particular direction (Dewey, 1938). Bandura (1997) suggests that mastering a performance, such as teaching, through experience is one of the most powerful influencers of efficacy.

## Purpose and Objectives

The purpose of this study was to explain the variance in teacher efficacy after the first 10 weeks of the student teaching, first-year teaching, second-year teaching, and third-year teaching experiences in agricultural education in Ohio using variables related to support, teacher preparation, and student teaching experience. The objectives of the study were to (1) describe the teachers in the population based on selected characteristics, and (2) determine the extent that the variability in teacher efficacy measured at the 10th week of the school year can be explained by variables related to perceived support, perceived teacher preparation quality, and perception of student teaching experience of student teachers and novice teachers in agricultural education in Ohio. To meet the *k:n* assumption of multiple regression, five variables were identified to represent the first three factors of support, knowledge and education, and student teaching that emerged from Knobloch and Whittington's (2002) study. The independent variables in this study were: utilized a mentor, perception of principal support, perception of collective efficacy, perceived quality of teacher preparation, and perceived quality of student teaching experience. The dependent variable of this study was teacher efficacy measured at the 10th week of the school year.

## Research Methods and Procedures

### *Population*

This descriptive-associational study sought to explain the variance of teacher efficacy using variables related to perceptions of support, teacher preparation, and student teaching in the population. Our target population consisted of a census of student teachers and novice teachers in their first three years of teaching in agricultural education in Ohio. The teacher education program in the university's agricultural education department and the state department of education provided the frame of the accessible population. There were 116 student teachers and novice teachers in the accessible population. The data were collected using Dillman's (2000) tailored design method with five contacts at the beginning of the 2001-02 school year. The data sample consisted of 106 teachers (91.4% response rate) who responded to the questionnaire.

### *Instrumentation*

The instrument used for this study was a mailed questionnaire containing 24 teacher efficacy items, 7 principal support items, 12 collective efficacy items, 1 mentor item, 2 teacher preparation items, and 2 student teaching items. Existing reliable and valid instruments were used to measure teacher efficacy, principal support, and collective efficacy. The Ohio State Teacher Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001) was used to measure teacher efficacy. Hoy, Tarter, and Kottkamp's (2000) Organizational Climate Description Questionnaire was used to measure supportive principal behaviors. Goddard, Hoy,

and Woolfolk's (2000) short form was used to measure collective efficacy. The researchers created the mentor, teacher preparation, and student teaching items based on Bandura's (1997) self-efficacy theory and Darling-Hammond's (1999) review of effective teacher characteristics. A panel of teacher education experts in the agricultural education department established content validity. The instrument was pilot tested with preservice teachers enrolled in undergraduate courses yielding a Cronbach's alpha of 0.87 for the teacher efficacy scale. Perceived teacher preparation quality had a post hoc reliability coefficient of 0.85 and perceived student teaching experience had a post hoc reliability coefficient of 0.78.

*Data Analysis*

Descriptive statistics were used to analyze data for Objective 1. Categorical data were reported as frequencies and metric data were reported as population means and standard deviations. Negatively worded items were reverse coded. Summated means and standard deviations were calculated for teacher efficacy, supportive principal behaviors, collective efficacy, teacher preparation, and student teaching experience. For Objective 2, a sequential search method using backward elimination multiple linear regression statistics were used to analyze the data. Effect sizes were computed using Cohen's (1988) *d* coefficient and index. The effect size decision criterion was established *a priori* ($R^2$ = .09, medium). The alpha level was established *a priori* at .05.

## Findings and Conclusions

*Objective 1:*

The following selected teacher characteristics were found. Twenty-two percent (*N*=23) were student teachers, 28% (*N*=30) were first-year teachers, 24% (*N*=25) were second-year teachers, and 26% (*N*=28) were third-year teachers who participated. Sixty-one percent (*N*=65) were male and 39% (*N*=41) were female. The average age of teachers in the study was 25.9 years (*N*=105, *SD*=6.37), ranging from 21 to 58 years. Sixty-one percent (*N*=63) of the teachers had a mentor. The teachers had "quite a bit" of efficacy, were in slight agreement with collective efficacy, perceived supportive principal behaviors as "often occurs," were in slight agreement with the quality of their teacher preparation, and were in moderate agreement that they had an excellent student teaching experience (see Table 1). Two relationships had moderate effect sizes: collective efficacy and supportive principal behaviors; and, collective efficacy and teacher efficacy.

*Objective 2:*

The five variables (utilized a mentor, perception of principal support, and perception of collective efficacy, perceived quality of teacher preparation, and perceived quality of student teaching experience) were entered into a backward

TABLE 1

*Regression of 10th Week Teacher Efficacy on Variables Related to Support, Teacher Preparation Quality, and Student Teaching Experience*

| Variables | Intercorrelations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $Y_1$ | *M* | *SD* |
| Collective efficacy ($X_1$)[a] | 1.00 | .07 | .39 | .15 | –.01 | .39 | 4.27 | .65 |
| Utilizing a mentor ($X_2$)[b] | | 1.00 | –.01 | .20 | .07 | .04 | .61 | .49 |
| Supportive principal behavior ($X_3$)[c] | | | 1.00 | .13 | .13 | .17 | 2.96 | .63 |
| Teacher preparation quality ($X_4$)[c] | | | | 1.00 | .26 | .20 | 4.36 | 1.12 |
| Student teaching experience ($X_5$)[c] | | | | | 1.00 | .20 | 5.07 | 1.14 |
| Teacher efficacy ($Y_1$)[d] | | | | | | 1.00 | 6.76 | .88 |

*Notes.* [a]Scale: 0=No, 1=Yes; [b]Scale:1=Rarely occurs, 2=Sometimes occurs, 3=Often occurs, 4=Very frequently occurs; [c]Scale: 1=Strongly disagree, 2=Moderately disagree, 3=Slightly disagree, 4=Slightly agree, 5=Moderately agree, 6=Strongly agree; [d]Scale: 1=Nothing, 3=Very little, 5=Some influence, 7=Quite a bit, 9=A great deal.

elimination, multiple linear regression model (see Table 2). Two variables (utilizing a mentor and supportive principal behaviors) were eliminated from the full model yielding a significant model with three variables ($p$=.001) explaining 17% of the variance in teacher efficacy at the tenth week of the school year. The full model had a medium effect size (Cohen, 1988). Collective efficacy accounted for 10.8% unique variance, Perceived Teacher Preparation Quality accounted for 1.0% unique variance, and Perceived Student Teaching Experience accounted for 2.8% unique variance. An examination of the residuals showed the assumptions were not violated. Furthermore, there was no concern of multicollinearity (lowest tolerance factor=.910; Highest VIF=1.10).

TABLE 2

*Summary of Backward Elimination Regression Analysis for Variables Explaining Teacher Efficacy of Student Teacher and Novice Teachers*

| Variables | Full model *B* | *SE B* | *B* | *T* | *p* |
|---|---|---|---|---|---|
| Collective efficacy | .46 | .13 | .33 | 3.43 | <.01 |
| Teacher preparation quality | .01 | .08 | .11 | 1.06 | .29 |
| Student teaching experience | .13 | .08 | .17 | 1.73 | .09 |
| (Constant) | 3.80 | | | | |

*Note.* Full model: $R^2$=.17, $F$=6.20, $p$=.001.

## Implications and Recommendations

Collective efficacy was related to supportive principal behaviors and teacher efficacy. This finding was congruent with several researchers. Hoy and Woolfolk (1993) found that teacher efficacy was influenced by principal influence with superiors. Newmann, Rutter, and Smith (1989) found administrator responsiveness and teachers helping one another to be associated with teacher efficacy. Tschannen-Moran et al. (1998) asserted that collective efficacy might have an effect on novice teachers as they are socialized into the profession. Goddard and Goddard (2001) found that teacher efficacy was higher in schools where collective efficacy was higher.

Collective efficacy, student teaching experience, and teacher preparation quality were collectively associated with teacher efficacy of student teachers and novice teachers during the first 10 weeks of the school year. The rank-order of importance of variables in the model implies that there may be sequential building blocks of teacher development (Glickman, Gordon, & Ross-Gordon, 2001). A quality teacher preparation program provides a foundation to develop teachers (Darling-Hammond, 2000; NCATE, 2001). Positive student teaching experiences engage preservice teachers to apply the concepts they learned in their teacher preparation programs (Borko & Putnam, 1996). However, during the first 10 weeks of the school year, collective efficacy was most closely associated with teacher efficacy of these three variables.

Collective efficacy is a group of teachers' shared belief in its collaborative capabilities to organize and execute courses of action required to produce student success (Bandura, 1997).Goddard and Goddard (2001) posited that teachers are aware of and influenced by the social processes and collective beliefs that make up a school. Based on his social cognitive theory, Bandura (1986) postulated that social influence shapes self-efficacy. Therefore, the social belief component of collective efficacy may indicate that student teachers and novice teachers may need to feel that they are part of an efficacious group of teachers. School organizational and contextual variables, especially the professional community of teachers, influence teachers' efficacy, motivation, and performances (Richardson & Placier, 2001). Further investigation of the school organizational and contextual variables should conducted, perhaps at various points of teacher development and the school year.

Although teacher educators would agree that preservice teachers need to have a positive student teaching experience accompanied by a quality teacher preparation program (Task Force on Field Experience Standards, 1999), teacher educators, cooperating teachers, and instructional leaders should focus on developing a sense of collective efficacy with novice teachers and their teaching colleagues during the first 10 weeks of the school year. This finding clearly implies that student teachers and novice teachers need to feel that they are part of a team of teachers who are supportive to each other in helping students learn (Friedman, & Kass, 2002).

Teacher educators should help preservice teachers understand and apply the concept of collective efficacy by helping them understand the normative school environment shaped by teachers' shared beliefs (Goddard et al., 2000). University supervisors, cooperating teachers, and instructional leaders should instruct, support, and guide novice teachers to collaborate with other teachers and help them understand the organizational processes and informal structure of schools (Friedman, & Kass, 2002).

The relationship between collective efficacy and teacher efficacy supports that these factors are theoretically related and have the same theoretical underpinnings (Bandura, 1997; Goddard & Goddard, 2001; Goddard et al., 2000). However, perhaps collective efficacy overshadowed the influences of teacher preparation and student teaching on teacher efficacy because collective efficacy is conceptually and operationally aligned with teacher efficacy. Tenably, a limitation of this study could have been measuring the novice teachers' perceptions of teacher preparation and student teaching experience based on four items. Further investigation should focus on identifying indicators that comprehensively measure quality teacher preparation and student teaching experiences and help clarify this possibility.

The various types of support that novice teachers' need should be identified as their needs change throughout the school year. Although principal support and utilizing a mentor were excluded from the model, they may not have been perceived as important during the first 10 weeks of the school year. Yet, they may appear to be associated with teacher efficacy later in the school year. Another limitation of the study was measuring if novice teachers had a mentor with one item. The mentoring relationship should be investigated to determine the contribution mentors make to novice teachers' efficacy.

Additional environmental factors should be investigated and mixed research methods such as focus group interviews should be conducted with novice teachers in the quest for grounded theory of understanding the nature of variables that influence teacher efficacy that emerged from this study. Novice teachers are influenced by various contextual factors and knowing which environmental factors contribute to positive growth and performance would help instructional leaders nurture and facilitate novice teachers' development who become effective, contributing teachers in the career and technical education profession.

## References

American Council on Education. (1999). *To touch the future: Transforming the way teachers are taught*. Washington, DC: ACE Fulfillment Service.

Anderson, B. H. (1977). An over the shoulder look at the contemporary philosophy and standards in vocational agriculture. *Journal of the American Association of Teacher Educators in Agriculture, 18*(1), 1-8.

Ashton, P. T., & Webb, R. B. (1986). *Making a difference: Teachers' sense of efficacy and student achievement*. New York: Longman.

Awayaa, A., McEwana, H., Heylerb, D., Linskyc, S., Lumd, D., & Wakukawa, P. (2003). Mentoring as a journey. *Teaching and Teacher Education, 19,* 45-56.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.

Borko, H., & Putnam, R. T. (1996). Learning to teach. In D. C. Berlinger & R. C. Calfee (Eds.), *Handbook of educational psychology*. New York: Simon & Schuster Macmillan.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Danielson, C. (1999). Mentoring beginning teachers: The case for mentoring. *Teaching and Change, 6*(3), 251–257.

Darling-Hammond, L. (1997). *Doing what matters most: Investing in quality teaching*. New York: National Commission on Teaching and America's Future.

Darling-Hammond, L. (1999). *Teacher quality and student achievement: A review of state policy evidence*. Seattle, WA: Center for the Study of Teaching and Policy.

Darling-Hammond, L. (2000). Teaching for America's future: National commissions and vested interests in an almost profession. *Educational Policy, 14*, 162-183.

Dillman, D. A. (2000). *Mail and internet surveys: The tailored design method* (2nd ed.). New York: John Wiley & Sons.

Field, J. C., Macintyre Latta, M. (2001). What constitutes becoming experienced in teaching and learning? *Teaching and Teacher Education, 17*, 885–895.

Feiman-Nemser, S. (1996). *Teacher mentoring: A critical review.* Washington, DC: ERIC Clearinghouse on Teaching and Teacher Education. (ERIC Document Reproduction Service No. ED 397 060)

Feiman-Nemser, S. (1992). *Helping novices learn to teach: Lessons from an experienced support teacher.* Retrieved February 12, 2003, from http://ncrtl.msu.edu/http/rreports/html/pdf/rr916.pdf

Friedman, I., & Kass, E. (2002). Teacher self-efficacy: A classroom-organization conceptualization. *Teaching and Teacher Education, 18*, 675–686.

Glickman, C. D., Gordon, S. P., & Ross-Gordon, J. M. (2001). *Supervision and instructional leadership: A developmental approach*. Boston: Allyn & Bacon.

Goddard, R. D., & Goddard, Y. L. (2001). A multilevel analysis of the relationship between teacher and collective efficacy in urban schools. *Teaching and Teacher Education, 17,* 807–818.

Goddard, R. D., Hoy, W. K., & Woolfolk Hoy, A. (2000). Collective teacher efficacy: Its meaning, measure, and impact on student achievement. *American Educational Research Journal, 37*, 479-507.

Guskey, T. R., & Passaro, P. D. (1994). Teacher efficacy: A study of construct dimensions. *American Educational Research Journal, 31*, 627-643.

Hoy, W. K., Tarter, C. John, & Kottkamp, R. B. (2000). *Open schools/healthy schools: Measuring organizational climate*. Retrieved June 21, 2001 from, http://www.coe.ohio-state.edu/whoy/on-line%20books_4.htm

Joerger, R., & Boettcher, G. (2000). A description of the nature and impact of teaching events and forms of beginning teacher assistance as experienced by Minnesota agricultural education teachers. *Journal of Agricultural Education, 41*(4), 104-115.

Joerger, R. M., & Bremer, C. D. (2001). *Teacher induction programs: A strategy for improving the professional experience of beginning career and technical education teachers*. Retrieved February 12, 2003, www.nccte.org/publications/

Holloway, J. H. (2001). Research link: The benefits of mentoring. *Educational Leadership, 58*(8) [Electronic version]. Retrieved from http://www.ascd.org/readingroom/edlead/0105/holloway.html

Knobloch, N. A., & Whittington, M. S. (2002, February). Factors that influenced beginning teachers' confidence about teaching in agricultural education. *Proceedings of the annual meeting of the AAAE Central Region Agricultural Education Research Conference,* St. Louis, MO.

Little, J. W. (1990). The mentor phenomenon. In C. Cazden (Ed.), *Review of research in education* (pp. 297-351). Washington, DC: American Educational Research Association.

McGhee, M. B., & Cheek, J. G. (1990). Assessment of the preparation and career patterns of agricultural education graduates, 1975-1985. *Journal of Agricultural Education, 31*(2), 17-22.

Miller, W. W., Kahler, A. A., & Rheault, K. (1989). Profile of the effective vocational agriculture teacher. *Journal of Agricultural Education, 30*(2), 33-40.

Mundt, J. (1991). The induction year: A naturalistic study of beginning secondary teachers of agriculture in Idaho. *Journal of Agricultural Education 32*(1), 18-23.

Mundt, J. P., & Connors, J. J. (1999). Problems and challenges associated with the first years of teaching agriculture: A framework for preservice and inservice education. *Journal of Agricultural Education, 40*(1), 38-48.

National Center for Research on Teacher Learning. (n.d.). Findings on learning to teach. Retrieved February 12, 2003 from http://ncrtl.msu.edu/http/folt.pdf

National Commission on Teaching and America's Future. (1996). *What matters most: Teaching for America's future*. New York: Author.

National Council for Accreditation of Teacher Education. (2001). *Professional standards for the accreditation of schools, colleges, and departments of education*. Washington, DC: Author.

Newmann, F. M., Rutter, R. A., & Smith, M. S. (1989). Organizational factors that affect school sense of efficacy, community and expectations. *Sociology of Education, 62*, 221-238.

Richardson, V., & Placier, P. (2001). Teacher change. In V. Richardson (Ed.), *Handbook of research on teaching* (4th ed.; pp. 905-950). Washington, DC: American Education Research Association.

Ruhland, S. K., & Bremer, C. D. (2002). *Alternative teacher certification procedures and professional development opportunities for career and technical education teachers*. Retrieved from www.nccte.org/publications/

Smylie, M. (1988). The enhancement function of staff development: Organizational and psychological antecedents to individual teacher change. *American Educational Research Journal, 25*(1), 1-30.

Talbert, B. A., Camp, W. G., & Heath-Camp, B. (1994). A year in the live of three beginning agriculture teachers. *Journal of Agricultural Education, 35*(2), 31-36.

Task Force on Field Experience Standards. (1999). *Standards for field experiences in teacher education*. Reston, VA: Association of Teacher Educators. Retrieved from http://www.siu.edu/~ate/standards/ATEstandards.pdf

Tschannen-Moran, M., Woolfolk Hoy, A., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research, 68*, 202-248.

Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy:Capturing an elusive construct. *Teaching and Teacher Education, 17*, 783-805.

U.S. Department of Education. (1997). *Characteristics of stayers, movers, and leavers: Results from the teacher followup survey: 1994-95*. Washington, DC: National Center for Educational Statistics.

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