

PERCEPTIONS OF MACHINE TRADES APPRENTICESHIP INSTRUCTORS
TOWARDS ONLINE INSTRUCTION

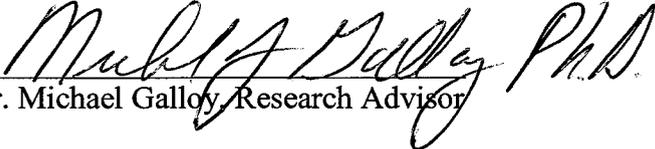
by

Thaddeus Hetzer

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Dr. Michael Galloy, Research Advisor

The Graduate College
University of Wisconsin-Stout
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The Graduate School
University of Wisconsin Stout
Menomonie, WI 54751

ABSTRACT

	Hetzer	Thaddeus	-
(Writer)	(Last Name)	(First)	(Initial)
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“On the other hand, the new methods are stimulants. However, these new methods of education will gradually find their place, and the outgrown methods will slip out” (Ford, 1929 p.23). These words from *My Philosophy of Industry* by Henry Ford, written in 1929 are his views concerning the use of still and motion pictures to reinforce how to read a micrometer. Seventy-four years later, technical education still struggles with new and emerging methods of delivery.

The delivery of technical instruction is changing at a rapid pace. The four walls of a classroom with a teacher at the podium, coupled with hands-on shop activities have been the standards for many years. Technology has been changing

this paradigm. This study will focus on the perceptions of the Wisconsin Technical College System (WTCS) machine trades apprenticeship instructors towards online instruction.

The review of literature revealed numerous instances of technical instruction being delivered in non-traditional ways. The literature review also reinforced how traditional delivery and assessment methods can easily be adapted, and sometimes enhanced, for online courses.

A written survey was sent to machine trades apprenticeship instructors in the state of Wisconsin. The survey consisted of questions regarding current delivery methods, personal online learning experiences, and perceptions of potential online delivery methods. A total of 29 instructors were surveyed with a response rate of 75.8 percent. The results indicated that the most frequently used traditional delivery methods (class discussion and lecture) were perceived as being easy or somewhat easy to deliver online by 72.7 percent and 59.1 percent of the respondents, respectively.

Potential results of this study include recommendations to move theory-based instruction for machine trades apprentices to an online format.

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CHAPTER I

INTRODUCTION

The roots of apprenticeship instruction in the United States can be traced back to the early 18th century. Formal training was delivered by a master craftsman who expected service in exchange for providing the apprentice with the mysteries of the trade (Filippelli, 1984).

Wisconsin was the first state to administer a formal apprenticeship program in 1911. "Apprenticeship is a training strategy that combines supervised, structured on-the-job training with related instruction and is sponsored by employers, employer associations or labor management groups that have the ability to hire and train in a working environment" (Department of Workforce Development, 2003, p.2). While the technical aspects of the trade were still learned on the job, state statute 106 provided for related instruction of theory to be delivered at designated trade schools (Industrial Commission of Wisconsin, 1936). The machine trades include both machinist and tool and die apprenticeships. While these are not the only trades under the machine trades umbrella, moldmakers, patternmakers, and toolmakers follow the same curriculum as the machinist and tool and die maker (Department of, 2003). Related instruction is delivered by the WTCS. Instruction is based on classroom hours; with the machinist apprentice attending 432 hours of instruction and the tool and die apprentice attending 576 hours of instruction. This instruction is

commonly delivered in one of two time formats; an eight hour day, weekly or bi-weekly until the requisite hours are met. In either format, the apprentice is paid an hourly wage for time spent in school and is protected by Wisconsin legislative mandate (Industrial Commission of Wisconsin, 1936).

As early as 1986, fundamental changes in the delivery of related-instruction for all apprentices were discussed. Fiscal pressure in the WTCS was causing many districts to rethink traditional delivery. A requirement that classes have more than 12 students, a change from the past practice of running a class with less, was causing cutbacks in offerings. The use of “high-tech” delivery methods, including interactive video equipment, was suggested as a possible remedy. Although this technology was in existence at the time, questions were raised as to the cost and accessibility to individual apprentices (Wisconsin Department, 1986).

Statement of Problem

Delivery of instruction for machine trades apprentices is largely theory based. Apprentices receive the hands-on portion of their training at the worksite. With advances in technology, comes the ability to deliver technical instruction in non-traditional ways. Even though this technology is advancing, it is necessary to research the perceptions of machine trades instructors towards the delivery of online instruction.

Purpose of the Study

The purpose of this study is to determine if delivery of related instruction for machine trades apprentices over the Internet is a viable alternative to traditional instruction. This determination will be based on if current delivery and assessment methods are compatible with online delivery and assessment methods. This study will give direction for future delivery methods for related instruction for machine trades apprentices.

Objectives

This study addresses the following objectives:

1. What are the current delivery and assessment methods for machine trades apprentice instruction?
2. What are the perceptions of machine trades apprentice instructors towards delivery and assessment methods used for online instruction?
3. Is there a relationship between frequency of current delivery and assessment methods and the perceptions of online delivery and assessment methods?
4. What effect do experiences with online instruction have on instructor's perception of online delivery and assessment methods?

Limitations of the Study

The limitations of this study are as follows:

1. The study is limited to related instruction in the machinist and tool and die apprenticeships in Wisconsin.
2. The study is limited to instructors who teach machine trades apprentices in Wisconsin.
3. The survey results are limited to the instructors who completed the survey.

Definition of Terms

Apprentice – One bound by legal agreement to work for another for a specific amount of time in return for instruction in a trade, art, or business (*The American Heritage Dictionary of the English Language*).

Bureau of Apprenticeship Standards (BAS) – A branch of the Division of Employment and Training Policy in the Wisconsin Department of Industry, Labor, and Human Relations (DILHR). The Bureau is responsible for setting apprenticeship training standards in the state of Wisconsin (Coenen, 2002).

Certification – An effort to insure to assure quality in the Wisconsin Technical College System through a program of continuous participation in activities that will contribute to professional growth (Lakeshore Technical College (1999)).

Portal – A webpage designed to offer a variety of Internet services from a single convenient location (Shelly, 2002).

Wisconsin Technical College System – The Wisconsin Technical College System delivers technical education which meets the needs, interests, and abilities of students and of the labor market. It is made up of 16 districts with 46 campuses (Wisconsin Technical, 2001).

CHAPTER II

REVIEW OF LITERATURE

Introduction

The purpose of this study is to determine if delivery of related instruction for machine trades apprentices over the Internet is a viable alternative to traditional instruction. This determination will be based on whether or not current delivery and assessment methods are compatible with online delivery and assessment methods. This study will give direction for future delivery methods for related instruction for machine trades apprentices.

Related instruction for machine trades apprentices has traditionally been delivered in a face-to-face format. Chapter two will explore current trends in the delivery of technical instruction and the delivery and assessment methods available for online instruction.

Online Delivery of Technical Instruction

A variety of organizations now offer online instruction in the technical disciplines. The National Association of Manufacturers' launched a Virtual University that offers courses directed towards manufacturing. The courses range from soft skills such as customer service to technical courses in hydraulics. As the word virtual suggests, much of the coursework is accessed via a computer. Conversely, other activities such as reading and test taking can be done on the students own time and away from the computer (Ryan, 2001).

A more comprehensive online training program can be found at www.toolingu.com. ToolingU is a collaborative effort between industry sponsors that includes Jergens Inc., a tooling supplier, Valenite Inc., a cutting tool manufacturer, and a variety of smaller organizations. What sets ToolingU apart from other online manufacturing training providers is the use of full-motion video. As with academic online courses, all training sessions are facilitated by a subject matter expert who has the ability to communicate with the trainee via email, message boards, or chat rooms (Dundas, 2001).

The Precision Metalforming Association (PMA) has taken online training a step further. PMA's Advanced Operator Training seminar, originally a videotape series, can now be accessed online. This series which features advanced production and diagnostic techniques can be completed by shop personnel without travel costs and with the added convenience of online registration (Train your Press, 2003).

Another advantage to online instruction is the gathering of up-to-date materials. Carpenter Technology Corporation, a maker of industrial tool steels, has launched a website that can serve as a resource for apprentices. Information on the website includes technical data, searchable databases, and links to trade organization serving the metal-processing field (New Carpenter, 2003).

Technical online instruction is not limited to private providers. The Virginia registered apprenticeship program is using the Internet to deliver courses in Industrial Safety. Roger G. Halsey, apprenticeship coordinator, Southwest Virginia Regional Office of Apprenticeship at Wytheville Community College, Wytheville, VA, has this to say about online instruction:

I use the online format for some classes to help overcome geographical challenges in the rural 17 county region for which I coordinate apprenticeship related instruction. It has the advantage of saving the apprentice regular travel to a campus, being available at any hour day or night (good for swing shift employees, single parents) and requiring only a single paid instructor (R.G. Halsey, personal communication, May 5, 2003).

In an effort to consolidate all of the online offerings in the system, the WTCS has developed, eTech. This portal primarily consists of general education courses with one notable exception. Tool Design Basic, an associate degree level course in the Mechanical Design Technician program at Lakeshore Technical College was the first manufacturing-related course offered on eTech. The primary focus of the course is the design and Computer-Assisted Design (CAD) drawing of industry-related tooling. The course transcended time and space when a student needed to be in Paris, France on business but still attended a weekly chat session via the Internet (Lakeshore Featured, 2003). This public, CAD – related training

dovetails with private industry. Engineering Geometry Systems also uses the Internet as a tool for CAD training. Virtual classrooms allow interaction with instructors and fellow students. This provides the best of both worlds: on-site structured training with off-site live interaction (CAD/CAM Training, 2003).

Online Delivery Methods

The American Heritage Dictionary of the English Language defines delivery as “the act of transferring to another.” From lecturing to demonstration, delivery can be disseminated in many ways. Competent delivery of online instruction doesn’t begin with the delivery itself. One should experience a course as a student to understand, firsthand, what works and what does not work (Online Learning, 2003). An even more powerful suggestion is to make sure that course is outside your field of expertise. This assures a true feel for an online learning experience without critiquing the subject matter (Frizler, 2003).

Of the many delivery methods used today in a traditional classroom, lecturing stands as a leader. Lecturing was popular in the Middle Ages where many people were unable to read and books were not yet readily available. Cognitive research now indicates that people fail to retain material minutes after they hear it. Discussion groups and project work are delivery tools that can be used in both a traditional and online environment (Dolezalek, 2003). While traditional courses meet at a prescribed time and place, online education can be accessed 24 hours a day, 7 days a week. This time advantage leads to ample

interaction if communication tools are consciously programmed into the course. Online discussion threads and group projects lead to information sharing and forged friendships. Passivity in web-based instruction is not inherent to the process; it is the result of poor instructional design (Meyer, 2003).

While in-person lecturing has the advantage of two-way communication, Internet lecture does not. This disadvantage can quickly be made into an advantage by answering the following questions: Can my lecture content be better learned from some other method? Is there a way to convey my passion for this subject in an online method? The answers can help determine alternatives to lecturing that will help to add a human element that is critical to a technology-driven media (Moore, Winograd, Lange, 2001).

It is also easy to make the online classroom learner-centered. In *Practice makes Learning: Effective Instructional Design for Distance Learning*, Judy Neill, Director of Instructional Design for the Worldwide Instructional Design System (WIDS), explains the need for learner-centered activities in distance learning:

Learners learn best when they are actively engaged in the learning process. Though learning activities fall on a continuum somewhere between teacher-centered and learner-centered, the best measure is the level of passivity or involvement on the parts of the learner (Neill, 2000. p.4).

Ms. Neill goes on to name activities such as role-play, chat room discussions, Internet research, and case studies that are well-suited for online delivery.

One of the advantages of web-based delivery is the use of short, informational learning activities. These activities called reusable learning or information objects (RLO's or RIO's) can contain information on a single learning objective. They are usually stored in a database and they can be used as is or modified for specific content (Mortimer, 2001). The connection to manufacturing RLO's can be found at www.wisc-online.com. Funded through a National Science Foundation (NSF) grant, the Wisconsin Online Resource Center has developed a database of over 200 RLO's covering many aspects of machine-related processes. The non-password protected site allows Internet users to view and link to these objects (Chitwood, 2000).

Face-to-face instruction provides for structured interaction between student and teacher. This interaction is dependent on many variables including regular attendance, class size, and course content. Although these variables also play a part in online courses, required and constant interaction is the most important component. This interaction can be achieved through discussion threads, feedback from students, and links to pertinent information on the Internet (Parker, 1996).

Will the transformation of course content be easy? Good teaching requires good preparation. “Just like education in the classroom, it begins with content, without which there would be no learning” (Maeroff, 2003 p.39). It is the added element of technology and the design of the course that will affect the outcome. The unfamiliarity with online instruction leads to some misconceptions; the biggest of which is that all instruction must be delivered entirely over the Internet. Many online courses use the same text as a traditionally delivered class. One of the attributes of online learning is the elimination of time and place requirements, not the overhaul of course content (Maeroff, 2003).

Summary

The American Distance Education Consortium (ADEC) has compiled a list of guiding principles regarding distance education. In order to adapt these principles, some basic assumptions must be made. The most powerful and the most important assumption relating to technical education reads: “The principles that lend themselves to quality face-to-face learning environments are often similar to those found in web-based learning environments” (ADEC Guiding Principles). The six principles cited by the ADEC could just as well be the principles of traditional technical education. They are:

1. The learning experience must have a clear purpose with tightly focused outcomes and objectives.
2. The learner is actively engaged.

3. The learning environment makes appropriate use of a variety of media.
4. Learning environments must include problem-based as well as knowledge based learning.
5. Learning experiences should support interaction and the development of communities of interest.
6. The practice of distance learning contributes to the larger social mission of education and training in a democratic society.

Virtually every method of delivery of technical instruction can be done over the Internet. Simulators and trainers have been used extensively in the airline industry as a safe substitute for hands-on training. Advances in virtual reality may soon make more types of hands-on training a possibility. Just as Henry Ford had this to say about new production methods – “There is a certain amount of mental inertia to be overcome in the promotion of any new thing. A few individuals may be quickly educated, but it takes time for society to consent to the adoption of a new way” (Ford, 1929 p.40-41). – so to will it take time to change the delivery of technical education.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this study is to determine if delivery of related instruction for machine trades apprentices over the Internet is a viable alternative to traditional instruction. This determination will be based on whether or not current delivery and assessment methods are compatible with online delivery and assessment methods. This study will give direction for future delivery methods for related instruction for machine trades apprentices.

Population Selection

The subjects of this study consisted of machine trades instructors that currently teach or have taught machine trades apprentices in the state of Wisconsin. Currently, nine districts in the WTCS deliver related instruction for machine trades apprentices. The districts are: Fox Valley Technical College, Lakeshore Technical College, Madison Area Technical College, Milwaukee Area Technical College, Moraine Park Technical College, Northcentral Technical College, Northeast Wisconsin Technical College, Waukesha County Technical College, and Western Wisconsin Technical College. A total of 29 instructors were surveyed. The number of instructors per district varied from a part-time instructor at Western Wisconsin Technical College to 12 instructors at Milwaukee Area Technical College. These numbers directly reflect the concentration of industrial

apprentices to larger metropolitan areas. Each instructor is certified through the WTCS as an instructor in the machine shop (certification area 420) and/or instructor in tool and die (area 439). All full- and –part-time occupational instructors must hold a baccalaureate or equivalent degree, plus a minimum of 4000 hours of work experience related to the trade. Since many tradespersons do not hold a baccalaureate degree, an alternative method of certification allows for seven years, or 14,000 hours of occupational experience as an equivalent to the degree. Five-year certifications are achieved through completion of seven courses in teacher training with subsequent certification based on completion of six college-level credits every five years (LTC, 1999).

Methodology

The survey instrument consisted of three parts. Part one contained 12 statements regarding individual teaching and assessment styles. The subject rated individual use of each style on a four point Likert scale ranging from extensively to rarely. Part two consisted of two questions regarding personal online course participation and the overall rating of the online learning experience. Part three consisted of 12 statements relating to online delivery and asked the subject to rate each statement on a four point Likert scale ranging from easy (one) to difficult (four). The statements in parts one and three contained similar content and were written in the same sequence.

Procedures

The procedures for this study was to first contact the Bureau of Apprenticeship Standards (BAS) and get a listing of each WTCS district that delivers related instruction for machine trades apprentices. The second step was to contact each of the identified districts and get a listing of instructors that teach related instruction for machine trades apprentices. An introductory letter, consent form, survey, return envelope, and a postcard were sent by mail to each subject on August 15, 2003. The postcard, to be returned to the researcher under separate cover, was included to minimize any follow-up correspondence while still assuring anonymity. A two week deadline was given for the response.

Data Analysis

The data will be analyzed based on each objective.

Objective one: What are the current delivery and assessment methods for machine trades apprentice instruction? Survey statements one through 12 pertain to current delivery and assessment methods. Respondents were asked to rate their use of each method as being used extensively, frequently, occasionally, or rarely. Each statement was tabulated as a percent.

Objective two: What are the perceptions of machine trades apprentice instructors towards delivery and assessment methods used for online instruction? Survey statements 15 through 26 pertain to delivery and assessment methods that could be used for online instruction. Respondents were asked to rate each

statement on a Likert scale from easy (1) to difficult (4). Each statement was tabulated as a percent.

Objective three: Is there a relationship between frequency of current delivery and assessment methods and the perceptions of online delivery and assessment methods? The survey was developed so statement one related to statement 15, statement two related to 16 and so forth for the remainder of the survey. Statements one through 12 and statements 15 through 26 were ranked by mean

Objective four: What effect do experiences with online instruction have on instructor's perception of online delivery and assessment methods? Survey questions 13 pertained to respondent's participation in an online learning experience. Respondents were asked to answer either yes or no. Question 14 pertained to the respondents overall rating of that experience. Rating choices were outstanding, average, poor, or not applicable. Responses to survey statements one through 12 and 15 through 26 were separated based on question 13. Each statement was tabulated as a percent and then ranked by mean.

CHAPTER IV

ANALYSIS OF RESULTS

Introduction

The purpose of this study is to determine if delivery of related-instruction for machine trades apprentices over the Internet is a viable alternative to traditional instruction. This determination will be based on whether or not current delivery and assessment methods are compatible with online delivery and assessment methods. This study will give direction for future delivery methods for related instruction for machine trades apprentices.

Population and Analysis

The subjects of this study consisted of machine trades instructors that currently teach or have taught machine trades apprentices in the State of Wisconsin. Currently, nine districts in the WTCS deliver related instruction for machine trades apprentices. A total of 29 instructors were surveyed. Of the 29 instructors 22 (75.8 percent) returned surveys. This data was collected by the researcher and presented to the research department at Lakeshore Technical College for analysis. The results of this analysis are presented in this chapter.

Objective One

The first objective of this study was to determine current delivery and assessment methods used for machine trades apprentice instruction. Table 3.1 rates survey statements one through 12 as a percent.

Table 3.1 - Current Delivery and Assessment Methods by Percentage

N = 22

Survey Statement	Extensively(1)	Frequently(2)	Occasionally(3)	Rarely(4)
Use of lecture	22.7	63.6	9.1	4.5
Use of videotapes	4.5	22.7	72.7	0
Use of class discussion	31.8	50.0	18.2	0
Use of demonstration	18.2	72.7	4.5	4.5
Use of guest speakers	0.0	0.0	31.8	68.2
Use of the Internet	9.1	0.0	50.0	40.9
Assignment of text-based reading	18.2	63.6	18.2	0
Assignment of research	4.5	13.6	45.5	36.4
Assignment of group projects.	4.5	18.2	50	22.7
Assignment of class presentations.	4.5	4.5	59.1	31.8
Administration of written assessments.	18.2	50.0	27.3	4.5
Administration of hands-on assessments.	27.3	40.9	18.2	13.6

Lecture, discussion, and demonstration and the assignment of text-based reading were cited as being used either extensively or frequently by over 80 percent of the respondents. The use of guest speakers and the Internet, and the assignment of class presentations were cited by over 90 percent of the respondents as being used only occasionally or rarely.

Objective Two

The second objective of this study was to determine the perceptions of machine trades apprentice instructors towards delivery and assessment methods

used for online instruction. Table 3.2 rates survey statements 15 through 26 as a percent.

Table 3.2 - Perceptions of Online Delivery and Assessment methods by

Percentage

N = 22

Survey Statement	Easy(1)	Somewhat Easy(2)	Somewhat Difficult(3)	Difficult(4)
Use of lecture	27.3	31.8	18.2	22.7
Use of videotapes or video clips	40.9	45.5	9.1	4.5
Use of class discussion or chat	18.2	54.5	22.7	4.5
Use of demonstration	9.1	31.8	27.3	31.8
Use of guest speakers	36.4	9.1	31.8	22.7
Use of the Internet	22.7	22.7	40.9	13.6
Assignment of text-based reading	59.1	31.8	9.1	0.0
Assignment of research	45.5	31.8	13.6	9.1
Assignment of group projects.	4.5	13.6	45.5	36.4
Assignment of class presentations.	4.5	27.3	36.4	31.8
Administration of written assessments.	22.7	54.5	13.6	9.1
Administration of hands-on assessments.	13.6	18.2	13.6	54.5

All of the teaching methods in Table 3.2 were perceived to be easy or somewhat easy to deliver and assess by at least one (4.5 percent) of the respondents. Assignment of text-based reading was perceived to be the easiest with a response rate of 59.1 percent. None of the respondents (0 percent) perceived assignment of text-based reading to be difficult to deliver online.

Objective Three

The third objective of this study was to determine if there is a relationship between frequency of current delivery and assessment methods and the perceptions of online delivery and assessment methods. Table 3.3 rank current delivery methods by mean and Table 3.4 rank the perceptions of online delivery methods by mean.

Table 3.3 - Current Delivery and Assessment Methods Ranked by Mean

N = 22

Survey Statement	Mean
Use of class discussion	1.86
Use of lecture	1.95
Use of demonstration	1.95
Assignment of text-based reading	2.00
Administration of hands-on assessments.	2.18
Administration of written assessments.	2.18
Use of videotapes	2.68
Assignment of group projects.	2.95
Assignment of research	3.14
Assignment of class presentations.	3.18
Use of the Internet	3.32
Use of guest speakers	3.68

Table 3.4 - Perceptions of Online Delivery and Assessment methods Ranked by Mean

N = 22

Survey Statement	Mean
Assignment of text-based reading	1.50
Use of videotapes	1.77
Assignment of research	1.86
Administration of written assessments.	2.09
Use of class discussion	2.14
Use of lecture	2.36
Use of guest speakers	2.41
Use of the Internet	2.45
Use of demonstration	2.82
Assignment of class presentations.	2.95
Administration of hands-on assessments.	3.09
Assignment of group projects.	3.14

Although none of the teaching methods in Table 3.3 correlated directly to the teaching methods in Table 3.4, lecture, class discussion, text-based reading, and written assessments appeared in the top six positions of both tables when ranked by mean.

Objective Four

The fourth objective of this study was to determine what effect experiences with online instruction have on instructor's perception of online delivery and assessment methods. Survey question 13 read: *Have you ever taken an online course?* Fifty-four percent of the respondents answered yes to question 13. Forty-six percent of respondents answered no to survey question 13. Table 3.5 rates survey statements 15 through 26 as a percent for respondents who answered

yes to survey question 13. Table 3.6 ranks survey statements 15 through 26 by mean for respondents who answered yes to survey question 13. Table 3.7 rates survey statements 15 through 26 as a percent for respondents who answered no to survey question 13. Table 3.8 ranks survey statements 15 through 26 by mean for respondents who answered no to survey question 13.

Table 3.5 - Perceptions of Online Delivery and Assessment methods of Respondents who have taken an Online Course by percentage

N = 12

Survey Statement	Easy(1)	Somewhat Easy(2)	Somewhat Difficult(3)	Difficult(4)
Use of lecture	25.0	33.3	16.7	25.0
Use of videotapes or video clips	41.7	41.7	8.3	8.3
Use of class discussion or chat	16.7	58.3	25.0	0.0
Use of demonstration	16.7	33.3	16.7	33.3
Use of guest speakers	8.3	16.7	50.0	25.0
Use of the Internet	25.0	25.0	41.7	8.3
Assignment of text-based reading	58.3	41.7	0.0	0.0
Assignment of research	50.0	50.0	0.0	0.0
Assignment of group projects.	8.3	0.0	50.0	41.7
Assignment of class presentations.	25.0	0.0	41.7	33.3
Administration of written assessments.	33.3	58.3	8.3	0.0
Administration of hands-on assessments.	8.3	33.3	8.3	50.0

Assignment of text-based reading and assignment of research were perceived to be easy or somewhat easy to deliver by all (100 percent) of the respondents.

Table 3.6 - Perceptions of Online Delivery and Assessment methods of Respondents who have taken an Online Course Ranked by Mean

N = 12

Survey Statement	Mean
Assignment of text-based reading	1.42
Assignment of research	1.50
Administration of written assessments.	1.75
Use of videotapes	1.83
Use of class discussion	2.08
Use of the Internet	2.33
Use of lecture	2.42
Use of demonstration	2.67
Use of guest speakers	2.92
Administration of hands-on assessments.	3.00
Assignment of class presentations	3.08
Assignment of group projects.	3.25

Assignment of text-based reading, assignment of research, administration of written assessments, and use of videotapes ranked as being easy or somewhat easy to deliver in an online format. Administration of hands-on assessments, assignment of class presentations, and assignment of group projects ranked as being somewhat difficult or difficult to deliver in an online format.

Table 3.7 - Perceptions of Online Delivery and Assessment methods of

Respondents who have not taken an Online Course by percentage

N = 10

Survey Statement	Easy(1)	Somewhat Easy(2)	Somewhat Difficult(3)	Difficult(4)
Use of lecture	30.0	30.0	20.0	20.0
Use of videotapes or video clips	40.0	50.0	10.0	0.0
Use of class discussion or chat	20.0	50.0	20.0	10.0
Use of demonstration	0.0	30.0	40.0	30.0
Use of guest speakers	70.0	0.0	10.0	20.0
Use of the Internet	20.0	20.0	40.0	20.0
Assignment of text-based reading	60.0	20.0	20.0	0.0
Assignment of research	40.0	10.0	30.0	20.0
Assignment of group projects.	0.0	30.0	40.0	30.0
Assignment of class presentations.	10.0	30.0	30.0	30.0
Administration of written assessments.	10.0	50.0	20.0	20.0
Administration of hands-on assessments.	20.0	0.0	20.0	60.0

Use of videotapes or video clips and assignment of text-based reading were perceived as being easy or somewhat easy to deliver by at least 80 percent of the respondents.

Table 3.8 - Perceptions of Online Delivery and Assessment methods of Respondents who have not taken an Online Course Ranked by Mean

N = 10

Survey Statement	Mean
Assignment of text-based reading	1.60
Use of videotapes	1.70
Use of guest speakers	1.80
Use of class discussion	2.20
Assignment of research	2.30
Use of lecture	2.30
Administration of written assessments.	2.50
Use of the Internet	2.60
Assignment of class presentations	2.80
Assignment of group projects	3.00
Use of demonstration	3.00
Administration of hands-on assessments.	3.20

Assignment of text-based reading, use of videotapes, and use of guest speakers ranked as being easy or somewhat easy to deliver in an online format. Assignment of group projects, use of demonstration, and administration of hands-on assessments ranked as being somewhat difficult or difficult to deliver in an online format.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The purpose of this study is to determine if delivery of related-instruction for machine trades apprentices over the Internet is a viable alternative to traditional instruction. This determination will be based on whether or not current delivery and assessment methods are compatible with online delivery and assessment methods. This study will give direction for future delivery methods for related instruction for machine trades apprentices.

Summary

The objectives of this study were to determine:

1. What are the current delivery and assessment methods for machine trades apprentice instruction?
2. What are the perceptions of machine trades apprentice instructors towards delivery and assessment methods used for online instruction?
3. Is there a relationship between frequency of current delivery and assessment methods and the perceptions of online delivery and assessment methods?
4. What effect do experiences with online instruction have on instructor's perception of online delivery and assessment methods?

Objective One

What are the current delivery and assessment methods for machine trades apprentice instruction? Respondents were asked to rank each method on a scale from extensively (1) to rarely (4). Class discussion was the most extensively used delivery method with a mean of 1.86. Use of guest speakers had the lowest rating with a mean of 3.68. The median of the data set was 2.43. The following delivery and assessment methods appeared in the top 50 percent of the group:

- Use of class discussion 1.86
- Use of lecture 1.95
- Use of demonstration 1.95
- Assignment of text-based reading 2.00
- Administration of hands-on assessment 2.18
- Administration of written assessments 2.18

These results were supported by the review of literature as common delivery and assessment methods that are used in both traditional and online formats. It can be concluded that the respondents follow traditional, theory-based instruction methods as they pertain to technical education. This data will be used as baseline data for objective three.

Based on these conclusions, it is recommended that machine trades apprenticeship instructors continue to follow these delivery methods. This recommendation is dependent on the ability to generate enough apprentices to

satisfy the minimum number of students to fill a traditional class. It is also dependent on the demographics of future machine trades apprentices. Younger apprentices may not be receptive to traditional delivery methods if they were exposed to online learning in primary and secondary schools.

Objective Two

What are the perceptions of machine trades apprentice instructors towards delivery and assessment methods used for online instruction? Respondents were asked to rate each method on a scale from easy (1) to difficult (4). Assignment of text-based reading ranked the easiest with a mean of 1.60. Assignment of group projects ranked the most difficult with a mean of 3.14. The median of the data set was 2.385. The following delivery and assessment methods appeared in the top 50 percent of the group:

▪ Assignment of text-based reading	1.50
▪ Use of videotapes or video clips	1.77
▪ Assignment of research	1.86
▪ Administration of written assessments	2.09
▪ Use of class discussion	2.14
▪ Use of lecture	2.36

These results were supported by the review of literature as common delivery and assessment methods that are used in both traditional and online formats. It can be concluded that the respondents perceive that, text-based

reading, the use of video clips, and the assignment of research as being easy to somewhat easy to deliver in an online format. This data will be used as baseline data for objective three.

Based on these conclusions, it is recommended that any conversion of traditional instruction to online instruction include text-based reading assignments. There is a wide variety of machine trades textbooks available today. Many publishers now include a CD-ROM that contains multi media presentations. These presentations could be easily adapted to online delivery. Research of current technical material is another component that should be included in any conversion. The review of literature revealed numerous sources of technical information.

Objective Three

Is there a relationship between frequency of current delivery and assessment methods and the perceptions of online delivery and assessment methods? Of the most frequently used delivery and assessment methods appearing above the median, four methods appear above the median in the online delivery and assessment data. The four methods are:

1. Assignment of text-based reading
2. Administration of written assessments
3. Use of class discussion
4. Use of lecture

The results show that online instruction in these four areas may be a viable alternative to traditional instruction. It can be concluded that the respondents feel that these components are a good match in both traditional and online delivery methods.

Based on these conclusions, it is recommended that a pilot course for machine trades apprentices be developed for online delivery. At a minimum, the four delivery methods outlined in objective three should be incorporated into the pilot course. These methods have been identified as both frequently used in traditional instruction and they are also perceived as being somewhat easy to deliver in an online format. Current materials could be used as a basis for any new online curriculum without major modification.

Objective Four

What effect do experiences with online instruction have on instructor's perception of online delivery and assessment methods? For respondents that have taken an online course, assignment of text-based reading ranked the easiest with a mean of 1.42. Assignment of group projects ranked the most difficult with a mean of 3.25. The median of the data set was 2.375. The following delivery and assessment methods appeared in the top 50 percent of the group:

- Assignment of text-based reading
- Assignment of research
- Administration of written assessments

- Use of videotapes
- Use of class discussion
- Use of the Internet

For respondents that have not taken an online course, assignment of text-based reading ranked the easiest with a mean of 1.60. Administration of hands-on assessments ranked the most difficult with a mean of 3.20. The median of the data set was 2.40. The following delivery and assessment methods appeared in the top 50 percent of the group:

- Assignment of text-based reading
- Use of videotapes
- Use of guest speakers
- Use of class discussion
- Assignment of research
- Use of lecture

The results show that four of the six methods appear in both sets of data. It can be concluded that experiences in online instruction do not have an effect on the perceptions of online delivery and assessment methods.

Based on this conclusion, it is recommended that taking an online course would not be a requirement for teaching an online course. However, perceptions are not the same as reality. Better online instruction may be achieved by experiencing an online class prior to actually teaching one.

Recommendations for Future Study

Future studies related to this subject should include research of the technology-related skills of machine trades apprentice instructors. Although curriculum could be written for online delivery, it is necessary to research the computer skills of the instructors so quality instruction is maintained. The study could be expanded to include the technology-related skills of future apprentices.

Since the apprenticeship model is an agreement between the apprentice and the employer, future studies should include the employer as well.

In addition, instructional materials used by machine trades apprentice instructors should be studied. A variety of material has been developed by the state of Wisconsin to insure continuity of instruction. Many instructors have augmented this material with customized worksheets and exercises.

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APPENDIX A: SURVEY LETTER

August 1, 2003

Dear Machine Trades Apprentice Instructor,

Delivery and assessment of related instruction for machine trades apprentices can take many forms. This can be due to individual instructor preferences as well as State and district policies. As delivery methods continue to evolve, perceptions of these methods becomes a valuable piece of information.

I am conducting a study of the perceptions of machine trades apprentice instructors towards online instruction. As a current or former machine trades apprentice instructor, your input is essential to my study and may be used to shape the future of related instruction for apprentices.

Please complete the enclosed survey and return it by 08/31/03 in the self-addressed envelope provided. Due to the small sample group be studied, I am also enclosing a post card that can be mailed under separate cover after you complete the survey. This will still assure anonymity and will minimize any follow-up correspondence.

Sincerely,

Thaddeus Hetzer

Enclosures: consent form, survey, postcard

APPENDIX B: CONSENT FORM

I understand that by returning the questionnaire, I am giving my informed consent as a participating volunteer in this study. I understand the basic nature of the study and agree that any potential risks are exceedingly small. I also understand the potential benefits that might be realized from the successful completion of this study. I am aware that the information is being sought in a specific manner so that only minimal identifiers are necessary and so that confidentiality is guaranteed. I realize that I have the right to refuse to participate and that my right to withdraw from participation at any time during the study will be respected with no coercion or prejudice.

NOTE: Questions or concerns about the research study should be addressed to the researcher, Thaddeus Hetzer, at 920-693-1799, email thhet@lsol.net or the research advisor, Dr. Michael Galloy, at 715-232-2163 email galloym@uwstout.edu

Questions about the rights of research subjects can be addressed to Sue Foxwell, Human Protections Administrator, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research, 11 Harvey Hall, Menomonie, WI, 54751, phone (715) 232-1126.

APPENDIX C: SURVEY

PART 1

Directions:

- Please read the following statements and put a check (✓) in the appropriate column that best describes your teaching style for machine trades apprentices.
- Please base your answers on a combination of ALL of the courses you teach for machine trades apprentices.

	Extensively	Frequently	Occasionally	Rarely
1. I use lecture as a teaching tool.				
2. I use videotapes as a teaching tool.				
3. I use a class discussion as a teaching tool.				
4. I use demonstration as a teaching tool.				
5. I use guest speakers as a teaching tool.				
6. I use the Internet as a teaching tool.				
7. I assign text-based reading assignments.				
8. I assign research outside of class time.				
9. I assign group projects.				
10. I assign individual class presentations.				
11. I administer written assessments.				
12. I administer performance-based (hands-on) assessments.				

PART 2

Directions: Please read the following questions and put a check (✓) in front the appropriate answer.

13. Have you ever taken an online course?

___ Yes ___ No

14. Overall, how would you rate your learning experience with an online course?

___ Outstanding ___ Average ___ Poor ___ Not Applicable

PART 3

Directions:

- The following statements concern teaching tools that **may be used in online delivery.**
- From an instructor's viewpoint**, please rate each statement on a scale from Easy (1) to Difficult (4) based on your knowledge of online delivery.
- Please rate each statement even if you have never taken an online course.**
- Circle the best rating.

	Easy			Difficult
15. Use of lecturing as a teaching tool	1	2	3	4
16. Use of videotapes or video clips as a teaching tool	1	2	3	4
17. Facilitation of class discussion or "chat" as a teaching tool	1	2	3	4
18. Use of demonstration as a teaching tool	1	2	3	4
19. Use of guest speakers as a teaching tool	1	2	3	4
20. Use of the Internet as a teaching tool	1	2	3	4
21. Assignment of text-based reading	1	2	3	4
22. Assignment of outside-of-class research	1	2	3	4
23. Assignment of group projects	1	2	3	4
24. Assignment of individual class presentations	1	2	3	4
25. Administration of written assessments	1	2	3	4
26. Administration of performance-based (hands-on) assessments	1	2	3	4

Thank you for taking time to complete this survey!