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Programs at Dunwoody College of Technology

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Daigle, Everette J. *Student and Faculty Perceptions of Textbook Value in the Manufacturing Programs at Dunwoody College of Technology*

Abstract

The purpose of this study was to examine the perceptions of students and faculty who utilize college textbooks in the completion and development of manufacturing courses at Dunwoody College of Technology in Minneapolis, Minnesota. Value and waste were used to construct the dialog used to question three separate focus groups of manufacturing students and faculty. By using focus group methodology, participants were safe to answer questions by validating, triggering and even contradicting the responses of their peers. More than 6 hours of audio files were transcribed into 90 pages of text that led to 12 unique categories used to define specific comments as they relate to textbooks.

Topics discussed included textbook acquisition, cost, availability, utilization, quality and non-traditional resources. Faculty and student responses were also compared for converging and diverging patterns. Results include recommendations from students and faculty on best practices and potential improvements to the current textbook model. The findings of this study can be used by college faculty and administrators to inform efforts and better utilize resources that support and enrich the learning process. By looking at textbooks from this perspective, new approaches for assessment, faculty development, textbook adoption and deployment can be identified and recommended for implementation.

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To my Mom and Dad, although I'm sad Dad couldn't be here to see this, I know he is watching down from above and is proud. Mom, thank you for always being there and for attending every one of my graduation ceremonies.

Finally, thank you to my Dunwoody family. I am proud to follow in Dr. Prosser's footsteps by showcasing vocational education as most vital to our country. Thank you to my students and faculty for supporting this study with such excitement. My only regret is that I am not a Dunwoody alumnus. Perhaps this will be my next degree.

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Chapter I: Introduction

Advanced manufacturing, 3D printing, autonomous vehicles, virtual reality, 4-billion internet users and mapping the human genome prove that we live in a very different world from that of our grandparents. Astronauts from 10 different countries have continuously occupied the International Space Station (ISS) since 2001 representing a level of scientific collaboration that is unparalleled (Howell, 2018). In a highly sophisticated global economy the need for a highly skilled workforce has put greater pressure on technical educators to provide workers capable of meeting this demand. Career and Technical Education (CTE) programs are needed now more than ever to meet our workforce needs and stay globally competitive (Conneely & Hyslop, 2018).

Unfortunately, higher education can be very expensive with the ever-increasing cost of tuition, fees and textbooks. As many complain about the rising cost of healthcare, it seems insignificant to compare the 600% increase in healthcare cost to the 1200% increase in higher education tuition and fees over the past 40 years (U.S. House, 2015).

In addition to tuition and fees, Dunwoody College manufacturing students are expected to spend an average of $403.80 per semester on textbooks alone (Dunwoody College, 2018a). This amount can fluctuate considerably depending on the format selected: new, used, purchased, rental or electronic. The cost of higher education in the United States has increased far faster than the inflation rate (Samuels, 2013). Part of this problem can be attributed to increased personnel costs in colleges and universities. In addition to instruction costs, the true cost to educate an undergraduate student includes accreditation, administration, benefits, research and facility costs (Samuels, 2013). The need to control cost is real and can only be accomplished by reducing waste and gaining efficiency (Balzer, 2010).

Lean methodologies rooted in the manufacturing success of the Toyota Motor Company have been adapted to many service sectors (Balzer, 2010). A common thread that emerges from lean manufacturing is the ability of stakeholders to identify value and waste. The Toyota model requires stakeholders to eliminate waste in an attempt to ensure customers are only paying for those things that add value to the process (Balzer, 2010). When it comes to textbooks, the application of lean tools requires research to determine the extent to which textbooks are currently being used to support and enrich the learning process. Textbook return on investment (ROI) is dependent on separating value and waste to analyze the model through a lean manufacturing lens.

Dunwoody College of Technology is an example of the type of institution that can benefit from applying a lean model. By applying lean principles to existing processes, colleges can decrease waste and increase value to their customers (Balzer, 2010). As a private non-profit institution that has been in continuous operation for more than 100 years, Dunwoody has trained more than 200,000 men and women for the workforce. Like most private schools, Dunwoody struggles to compete with state colleges which have significantly lower tuition. The ability to deliver a different value-proposition than its competitors by providing an array of hands-on technical programs that range from certificates to baccalaureate degrees gives Dunwoody an advantage. With the rising cost of textbooks, many students have been found to be waiting to buy books, sharing books or even going without (Redden, 2011).

There is an impetus for all higher education institutions to reduce cost while providing students with the tools they need to be successful. Prosser and Quigley (1949) stated "the administration of vocational education will be efficient in proportion as it is elastic and fluid rather than rigid and standardized" (p. 231). They went on to describe that administration needed to compromise between efficiency and cost. Textbooks represent one of many possible areas for

improvement. By eliminating waste, Dunwoody can concentrate on "changing lives by building opportunities for graduates to have successful careers, to develop into leaders and entrepreneurs and to engage in the better performance of life's duties" (Dunwoody College, 2018b). Although learning resources such as the college textbook represent only one application of lean in higher education, it provides a starting point for this type of study.

CTE students and faculty perceptions differ on the role of the textbook in reference to the curriculum. Jones (2011) observed "the majority of students appear to be using their textbooks as study aids that help them complete their homework" (p. 34). Ball and Cohen (1996) noted instructors "choose tasks or models and navigate instructional resources such as textbooks in order to design instruction" (p. 7). Considering the high cost of textbooks and differences in perspective, it is not clear if students and faculty are experiencing an adequate return on their investment.

Statement of the Problem

In a highly sophisticated global economy higher education is more important than ever. Unfortunately, higher education can be very expensive with the ever increasing cost of tuition, fees and textbooks. Textbooks require a significant monetary investment especially in the context of career and technical education. This can, at times, create a barrier to student success. There is limited research on faculty and student perceptions regarding textbook return on investment. Therefore there is a need to determine the extent to which textbooks add value to the teaching and learning experience within selected CTE programs.

Research Questions

Given the problem presented above, this study will address the following questions:

1. To what extent are textbooks adding *value* to the teaching and learning process from the perspective of students enrolled in selected CTE programs?

2. To what extent is there *waste* relative to the roles that textbooks can play in the teaching and learning process from the perspective of students enrolled in selected CTE programs?

3. To what extent are textbooks adding *value* to the teaching and learning process from the perspective of faculty in selected CTE programs?

4. To what extent is there *waste* relative to the roles that textbooks can play in the teaching and learning process from the perspective of faculty in selected CTE programs?

Significance of the Study

This study intended to uncover perceptions concerning how students and faculty feel about the current textbook model. The findings of this study can be used by college faculty and administrators to inform efforts and better utilize resources that support and enrich the learning process. By looking at the textbook from a value-added perspective, new approaches for assessment, faculty development, textbook adoption and deployment can be identified and recommended for implementation.

Assumptions of the Study

As a qualitative study that relied on disclosure from focus group participants, the following assumptions were assumed to be true to support the given methodology.

1. Focus group participants will answer questions in an honest and candid manner.

2. Population sampling and subject selection was appropriate to acquire a representative cross-section of the population.

3. Focus group participants have a sincere interest in the research being conducted and are not involved for ulterior motives.

4. The results of this study can be generalized to represent a more global perspective of the value of textbooks in career and technical education.

Limitations of the Study

The following items were identified as limitations of this study:

1. This study was performed at a private, not-for-profit institution of higher education focused on technical and career preparation.

2. The quality of discussion is largely dependent upon the ability of the moderator to probe participants to assist in producing results.

3. Focus group research relies on self-disclosure which can be more difficult for shy or quiet participants.

4. There is limited prior learning resources and research studies utilizing lean principles to which the results can be compared.

Definitions of Terms

The following key terms and acronyms were central to understanding the foundation, development and interpretation of results in this study.

Benefit. Textbooks are considered to be beneficial when the learning experience is greatly enhanced as a direct result of the textbook.

Career and technical education (CTE). For the purpose of this study CTE refers to those hands-on educational programs taught within the Manufacturing Department at Dunwoody College.

Importance. Textbooks are considered important when they are deemed as an integral part of the development and execution of the coursework.

Irrelevance. Textbooks are considered irrelevant when they are seen as unimportant, underutilized or unnecessary to the coursework.

Lean. A process improvement strategy used in manufacturing and service industries to eliminate waste and ensure customers are only paying for those things that add value.

National Institute for Metalworking Skills (NIMS). NIMS is a professional organization that provides testing and accreditation for manufacturing students.

Non-traditional student. Any student that is greater than or equal to 25 years old.

Return on investment (ROI). For the purpose of this study, ROI refers to the perceived value of a textbook compared to the price paid to obtain the textbook.

Source of confusion. A textbook that causes students to question instruction due to inconsistencies or poor relation to the instruction would be considered a source of confusion.

Traditional student. Any student that is less than 25 years-old.

Usefulness. A useful textbook is a tool that students and faculty would consider keeping on-hand and referencing in the future.

Value. For the purpose of this study, value was measured by considering student and faculty perceptions of textbook importance, benefit and usefulness.

Waste. For the purpose of this study, examples of waste include but are not limited to; irrelevance, underutilization, poor return on investment (ROI) or a source of confusion.

Chapter II: Literature Review

In a highly sophisticated global economy higher education is more important than ever. Unfortunately higher education can be very expensive with the ever increasing cost of tuition, fees and textbooks. Textbooks require a significant monetary investment especially in the context of career and technical education. There is limited research on faculty and student perceptions regarding textbook return on investment. The following review of literature confirms the need to determine the extent to which textbooks are being used to support and enrich the teaching and learning process within selected CTE programs.

Global Sophistication and the need for Higher Education

In a highly sophisticated world, the level of education matters from an employment perspective. Kelly and Strawn (2011) projected that "by 2018, nearly two-thirds of the nation's jobs will require some postsecondary education or training" (p. 1). According to the Manufacturing Institute (2015) "over the next decade nearly 3.5 million manufacturing jobs likely need to be filled – the skills gap is expected to result in 2 million of those jobs going unfilled" (p. 2). These jobs are critical to our economy and the vast majority of these jobs require the type of technical training found in CTE programs. The Manufacturing Institute (2015) found "82 percent of executives responding to the Skills gap survey indicate they believe the skills gap will impact their ability to meet customer demand" (p. 2).

Workers without post-secondary education often lack the basic computer, mathematics and technical training required to be successful in the 21st century (Manufacturing Institute, 2015). Statistics from the Bureau of Labor and Statistics show that each level of education obtainment results in both greater earning potential and better employment outcomes (U.S. Department of Labor, 2016). For example, Table 1 clarifies workers with an associate's degree can expect to earn 18% more per week than those with only a high school diploma. In addition to

greater earnings, the unemployment rate is significantly reduced with each academic credential. Workers without a high school diploma are twice as likely to find themselves unemployed when compared to those with an associate's degree.

Table 1

Unemployment and Earnings by Education Level

Education Level	Unemployment Rate	Median Weekly Earnings
Doctoral Degree	1.6 %	$1,664
Professional Degree	1.6 %	$1,745
Master's Degree	2.4 %	$1,380
Bachelor's Degree	2.7 %	$1,156
Associate's Degree	3.6 %	$819
Some College, No Degree	4.4 %	$756
High School Diploma	5.2 %	$692
Less than a HS Diploma	7.4 %	$504

Source: U.S. Bureau of Labor & Statistics 2016

Transmission of Knowledge

In an effort to address the current shortages within the U.S. labor force, career and technical education programs are tasked with training the workers necessary to fill the gaps. These systems are challenged to accomplish this within the context of decreasing funding, rising tuition and increased accountability (Lang, 2016). Within this context, value associated with teaching and learning textbooks and other resources needs to be understood.

The transmission of knowledge from instructor to learner is quite complex. McGrath and Coles (2015) find "a learner could cover more ground in an hour by reading a textbook than by attending a lecture" (p. 56). Although the volume of material covered would be great, a textbook

alone is not sufficient especially when it comes to CTE coursework. Cocchiarella (2015) states "education not only involves the pure cognitive but also the affective and the psychomotor domains" (p. 3). The transmission of knowledge requires teachers go beyond theoretical knowledge. Teachers are expected to adapt their lessons to meet the needs of their current students (Cocchiarealla, 2015). Threeton and Walter (2009) looked at Kolb's learning styles (accommodating, diverging, converging and assimilating) in an attempt to define the best learning activities to teach a diverse group of automotive students. Activities as well as the instructor role varied widely depending on the learning style of the student. It's important for instructors to have an arsenal of instructional techniques to meet the different learning styles. Student presentations, class discussions, lab assignments and demonstrations represent four different strategies used by automotive instructors to hit all of the learning styles (Threeton & Walton, 2009).

Learning Styles

It's long been thought that tailoring the learning environment to the learner's preferred learning style results in the best outcomes for the student (Pashler, McDaniel, Rohrer, & Bjork, 2008). This is to say that auditory learners are best taught using auditory methods while visual learners are best taught using visual methods. Contrary to this belief there is no statistical data to support specific alignment of teaching to learning style (Rogowsky, Calhoun & Tallal, 2014). This evidence was backed up by Pasler et al., (2008) who also found no credible evidence to support aligning to individual learning styles. Instead the general consensus is that the method in which the material is presented should be based upon what best suits the content not the individual learner (Riener & Willingham, 2010).

As technology continues to advance, a variety of learning resources have made it much easier to implement multimodal pedagogy. The onset of online education has made converting

lectures and readings to Podcasts, YouTube videos or other media quite popular right now. With the recent popularity of audiobooks and e-books, Google and Audible are battling to shape the future textbook model for higher education (Kim, 2018).

Role and Purpose of the Textbook

Textbooks serve to represent the collective information available in a certain topic area or profession (Berry et al., 2010). Considerable debate has occurred regarding the role and cost of the textbook in recent years. Harwood (2017) finds that "teachers use textbooks in any number of different ways, adapting and adding to them – or omitting some or all of a given activity" (p. 264). He went on to describe a mathematics instructor using the textbook to provide course structure, homework problems and example problems that could be worked both in and out of the classroom (Harwood, 2017). He noted many teachers utilize the textbook as a starting point for course development in which case the textbook's intended curriculum is used to develop and refine what will become a new course.

As faculty develop curriculum for new courses or adapt existing ones, relationships between credits, class hours and homework must be well-defined. Defined as the Carnegie unit, one college credit consists of three hours of coursework (Silva, White, & Toch, 2015). For example, a one-credit course might require students to attend one hour of lecture, one hour of recitation and perform one hour of homework in a given week. Instructors utilize the textbook to supplement this coursework through assigned readings, practice problems and case studies designed to prepare students for in-class discussions and group work (Berry et al., 2010).

Although readings are assigned to supplement the coursework, they are not always done. Richardson (2004) found an "expectation that students would 'do the reading' from the textbook was carried forward and reiterated by every member of the teaching staff" (p. 511). He went on to point out that classes often started with a question to find out who did or did not complete

required readings. Although both students and faculty describe an overwhelming need for students to read the textbook, the consensus was that students struggled to engage the materials at the level necessary for course success (Richardson, 2004).

Berry et al., (2010) found that students predominantly use the textbook "in preparation for exams, if they have specific questions or when working on homework" (p. 34). Many instructors have started to supplement or even replace the college textbook with exhaustive lists of web-links and resources. Berry et al., (2010) find "the introduction of various resources to supplement the textbook often results in students facing a daunting choice of learning tools and aids" (p. 38). The textbook continues to be the single best resource for students and is critical to the creation and delivery of college-level curriculum (Berry et al., 2010).

Work, Life, and School Balance

Students struggle to balance work, life and school in the modern age. The Gates Foundation (2018) finds that 26% of college students work full-time and 28% of college students have children. Commitments outside of the classroom have a significant effect on student's ability to actively participate in the curriculum at the necessary level. Horsley, Knight and Huntly (2010) find students are "time-poor and as a consequence, their ability to engage fully with all learning resources recommended by course coordinators and tutors is limited" (p. 43).

Worley (2011) finds the "net generation's access to immediate information has taught them to expect immediate answers and feedback" (p. 34). Worley (2011) found that "millennials are so saturated with technology that by the age of 21, they average 10,000 hours playing video games, 2,000 hours watching television, 10,000 hours on the cell phone, and have sent or read 200,000 emails" (p. 33). Modern college students are very visual causing them to struggle when it comes to reading the textbook often jumping back and forth with a very limited attention span (Worley, 2011). Horsley et al., (2010) found "students report less preference for lengthy

textbooks and readings, preferring especially lecture notes, web resources and 'dummies' guides to a specific assessment task" (p. 58).

Textbook Concerns for CTE

CTE students bring an additional wrinkle to the teaching and learning environment. The hands-on learning environments utilized in career and technical education are modeled after the industry (Reese, 2010). CTE students are not only required to utilize textbooks to acquire the theoretical knowledge, but are also required to use technical and trade manuals standard to their individual industries. Code books used by electricians, machinists and welders contain hundreds of pages of information that do not allow for error. Penisten (1993) found "technical material is often concisely and precisely worded using technical vocabulary to state difficult ideas and concepts" (p. 3).

Reading is one of the most critical skills CTE students need to have to be successful in their respective fields (O'Connor, 2010). Although many CTE students enroll in community and technical colleges because they were not college-ready, the ability to read and interpret highly technical writings is imperative (Penisten, 1993).

CTE instructors have the unique opportunity to hone their students reading skills because of their unique interest in a skill or trade. O'Connor (2010) finds "students are more likely to read and comprehend material that interests them - the practical and occupational nature of CTE subjects can foster this interest" (p. 35). By equipping CTE classrooms with alternative reading materials such as trade magazines, career guides and newsletters, CTE students are more likely to read for fun and therefore better equip them for the technical writings required by their trade (O'Connor, 2010).

Textbook Selection

Keenan and Haight-Keenan (2012) suggest "experienced teachers realize that textbooks function as a co-instructor and bring to the classroom their own pedagogy that can turn a teaching experience from rewarding to burdensome, or vice versa" (p. 117). To make the selection process easier, they suggests five considerations for faculty when selecting a text.

1. **The Profile of the Teacher** – It's important for teachers to consider their own ways of thinking and learning and to ensure textbook alignment.

2. **The Profile of the Author** – It's important to consider the expertise of the author. This can be done by researching other publications by the author and in some cases even reaching out to the author with questions.

3. **Content and Organization** – Content is what we are paying for, but it's also important to consider the depth and organization of the content.

4. **Design** – Design involves how the book actually works. Textbooks are not designed to be ready cover to cover so it is imperative that headings, fonts, definitions and visuals are appealing to the reader and at the appropriate level for the course design.

5. **Ancillary Resources** – No single textbook is perfect for every teacher or learner. It is important that ancillary resources such as videos, slide decks, reviews and test-banks are well-constructed and supplement the text.

Hong Kong's Education Bureau (2016) described several guiding principles that align with Keenan's considerations for selecting a quality textbook. Among these principles are content, learning and teaching, structure and organization, language and layout. Teachers should also consider end of course surveys that include the opportunity for students to evaluate the effectiveness of the textbook (Keenan & Haight-Kennan, 2010).

Effective Practice

Jones (2011) states that "students approach textbooks differently from the traditional notion that many instructors encourage" (p. 35). An overwhelming 87% of accounting instructors surveyed expected students to read the textbook prior to class (Jones, 2011). While 95% of accounting students say the textbook helped them succeed, only 7% responded that they read the textbook prior to class (Jones, 2011). Students mostly use the textbook as a source for step-by-step examples when struggling with homework (Jones, 2011).

Several researchers have studied how students learn in an attempt to place value on the different resources available. French et al., (2015) found student's "primary means of learning the course material was classes (46%), with the textbook being the second most common choice (36%) and well above assignments (8%)" (p. 174). Their work suggested students find the textbook most valuable when it supplements the material covered in-class. Students are far less likely to utilize optional or *recommended* books as resources.

Although both instructors and students find value in textbooks, they seem to differ greatly on their definition of value. Students rank completing homework (47%) as most important to success, with attending class (42%) next and finally reading the text (11%) (Jones, 2011). He recommended "highlighting key review concepts and providing clear examples that illustrate these concepts will better help students locate the material that is most relevant to solving the homework problem" (p. 35). He went on to propose the structure of the textbook is the very thing that makes students uninterested in reading it (Jones, 2011).

Eldridge (1935) found:

> The best sort of text is not a textbook at all, but what the publishers somewhat quaintly call a "trade book." That is, textbookish features are excluded or subordinated, and it is designed to entertain as well as instruct the reader, just as are books written for the so-

called general reader. This will give authors a freedom they do not now enjoy. They will

not need to take themselves quite so seriously; they will not be so concerned to display

their erudition; they can take their readers into their confidence; and they may resort

freely to incident and illustration in order to adorn the tale and intrigue the reader's

interest. (p. 644)

According to Graham (2016), the success of the *Dummies* books over the past 25 years

proves that we live in a world where readers expect to bounce into a subject with no knowledge

and pick up skill very quickly. She reported everything from vegetable gardening to learning

Python programming can be exposed in a light and easy to read manner without making the

reader feel as if the author is talking down to them. She went on to argue many home brewing

operations started with a $20 investment in *How to make your own beer for Dummies*. Some of

these home brew operations have even gone on to become large-scale businesses. Her examples

speak to the potential value of textbook-like publications as resources for learning.

Joseph (2015) finds that "publishers dictate terms to authors and intermediaries and

readers, who are the end-users play a very limited role in the entire book value chain" (p. 265).

New models including e-books and self-publishing has allowed authors to speed up the textbook

supply chain and customize it towards the features students and faculty demand (Joseph, 2015).

Joseph (2015) found several feature advantages e-books have over the traditional textbook.

1. **Modularity** - Digital textbooks are modular allowing faculty to select certain
   chapters of texts and thus reducing the cost.

2. **Accessibility** – E-books can be accessed from any device with an internet connection
   offering equal access to all students.

3. **Dictionary Plug-Ins** – Digital plug-ins offer search functionality as well as e-reading
   and language functionality for students whose primary language is not English.

4. **Broad Digital Content** – Real-time links to digital content such as audio, video or other internet collections can be accomplished live in the text.

5. **Updates** – Content updates can be quickly and efficiently accomplished on a monthly, weekly or even daily basis.

6. **Storage and Distribution** – E-books require minimal storage and distribution further driving costs and freeing up precious real-estate for other activities.

Textbook Value Proposition

Burgraff (2016) found textbook costs "have gone up by 800 percent" (p. 48) in the past 30 years. In the same period the consumer price index has increased by 250% (Burgraff, 2016). The United States Government Accountability Office (USGAO) found the cost of the college textbook increased by 82% from 2002 to 2012 (USGAO, 2013). See Figure 1.

Percent increase since 2002
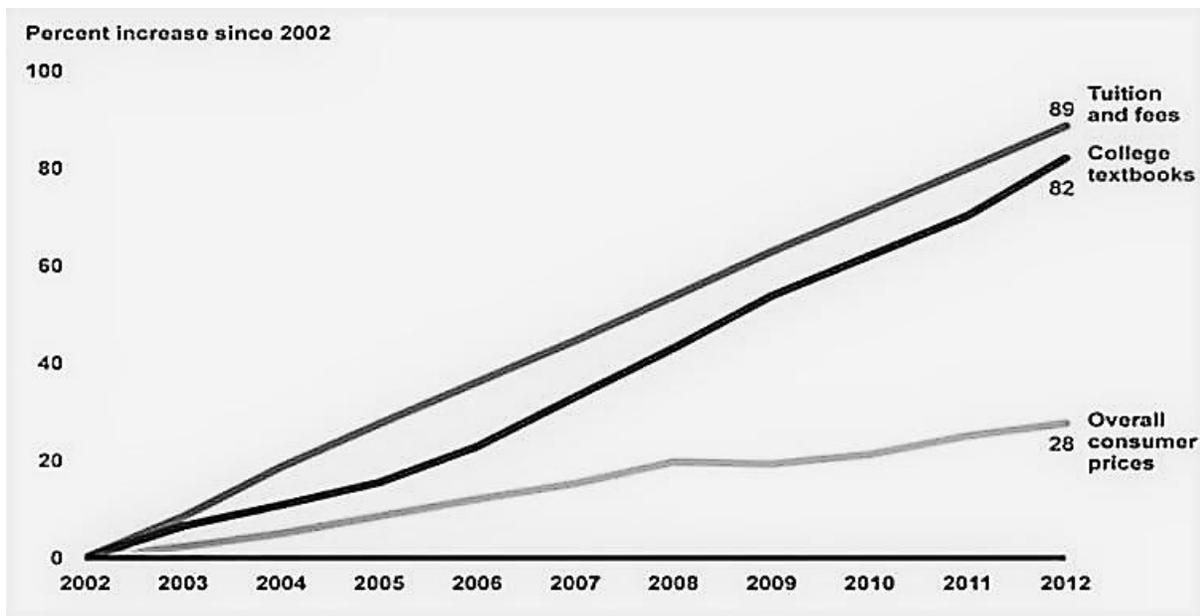
Figure 1. College costs vs Consumer Price Index.

The price of the college textbook is controlled by the publishers working closely with

college bookstores. Burgraff (2016) finds "price is removed from the decision-making process

and that disproportionate power sets the product (aka textbook) at a high price" (p. 47). The 2010

Higher Education Opportunity Act attempted to give students more purchasing power by

requiring institutions of higher education to publish ISBN numbers and pricing information on

both required and recommended texts for each course (U.S. Department of Education, 2010).

The *Chronicle of Higher Education* reported 70% of college students have skipped

buying a required textbook due to cost (Redden, 2011). Of the students that have skipped buying

textbooks, 78% of them reported that this directly affected their performance in one or more

classes. Aside from just obtaining the books needed for class, several studies have shown that

fewer than 30% of college students actually completed assigned readings prior to class (Hoeft,

2012). While the price of the college textbook is on the rise, utilization is actually declining.

Modern college students are less likely to purchase and keep their textbooks for future

reference. Joseph (2015) finds only "one-third of students in the US purchase new textbooks

leading to a return rate of 24% from college bookstores to publishers" (p. 268). He reported publishers only make money when new books sell, this means used books drive up the cost of new editions in the future. Used textbooks are the most popular with more than one-third of students buying used textbooks, as each used book is turned over as many as six times (Joseph, 2015). Nearly one-third of students reported they did not buy books at all. The vast majority of these students report the primary reason for not acquiring the textbook was cost.

Increasing textbook costs only add to the great many things students are trying to finance their way through college. Martin et al., (2017) found eight key costs college students try to balance: housing, food, savings, transportation, health, education, clothing and recreation. They also noted a common practice on campus is to wait until a class starts to see if the textbook is really necessary. They found more than 80% of college students have a negative attitude towards the current textbook model. Finally the most common complaints students had in reference to textbooks included:

1. **Limited Bookstore Purchasing Options** – Books are readily available in the bookstore, but the options for new, used, purchase or rental can be limited.

2. **Limited Classroom Use** – Some professors require the purchase of a textbook that is rarely used.

3. **Updated Versions** – Students are required to purchase the latest version when older versions are readily available at a greatly reduced cost.

4. **Open Resources Ignored** – Students are often required to purchase a book for which online resources or open textbooks would suffice.

The influence of textbook cost and utilization has a direct impact on the quality of life for college students (Martin et al., 2017). By listening to their stakeholders, colleges can address concerns by defining value and waste within the current textbook model.

Managing Quality in Higher Education

According to Koch (2003) "one cannot talk about quality or measure it unless one has a defined notion of what one is doing and who is being served" (p. 331). He suggested the first step involved in measuring quality is to define the customer. Searcy (2017) found many colleges have adopted a customer service approach that includes informational one-stop desks and college staff wearing nametags in an effort to model themselves after the customer-first approach seen in department stores. He argued colleges continue to struggle with the argument that the student is the customer instead preferring to reference the industry or society as the ultimate customer of higher education.

Unlike higher education, manufacturing processes are easy to quantify. According to Koch (2003) an automobile manufacturer can quantify results by the number of automobiles produced, defects found or the number sold. He argued colleges and universities have it more difficult when trying to define quality. Many colleges attempt to quantify quality using graduation rates, placement rates or high-stakes testing.

Nursing schools have been tasked to prove program quality via the percentage of graduates that pass the NCLEX-RN licensing examination (Molsbee & Benton, 2016). In response to this requirement, many schools mandate students to take and pass the HESI RN preparation examination as a requirement for graduation (Molsbee & Benton, 2016). They also found in rare cases students completing all of the required coursework were not allowed to graduate because they failed to pass the HESI exam. Students are not manufactured parts that can be simply scrapped because they fail to meet a quality measurement.

In response to defining value, Balzer (2010) recommends "defining value from the perspective of the beneficiaries, the universities goal should be to deliver that value" (p. 127). Amid the many techniques available, college administrators should consider direct observation,

archival data, focus groups and interviews, surveys, Kano analysis and bench-marking among the best options for gaining a better understanding of value in higher education (Balzer, 2010). Balzer (2010) recommends a "focus group facilitator can guide discussions to obtain detailed information about faculty member's experiences with existing processes that support education" (p. 134). Before quality can be measured, institutions of higher education must define value and implement processes for value-based continuous improvement if quality is ever expected to drive decision-making (Koch, 2003).

Lean Higher Education

Lean manufacturing and higher education methodologies are similar from the standpoint that the goal is to add value and eliminate waste for the customer (Womack & Jones, 1996). In the case of a college textbook there are two customers; the instructor and the student. According to Womack and Jones (1996) "value can only be defined by the ultimate customer" (p. 16). Although education can be thought of as a service industry, lean tools have been adapted to many service industries to the great benefit of customers (Francis, 2014). When students see little value in a textbook or in some cases cannot afford the textbook, customer focus has been lost. Lean activities require continued efforts to identify and eliminate waste (Womack & Jones, 1996). Making activities more flexible and responsive to customer needs is imperative. Womack and Jones (1996) state, "the objectives of lean enterprise are very simple: correctly specify value for the customer, avoiding the normal tendency for each firm along the stream to define value differently to favor its own role" (p. 276). This of course starts with asking the customer what makes the product or service valuable to them.

Dr. W. Edwards Deming was an influential engineer, statistician and writer best known for his work in Japan post World War II. Deming's work was instrumental in Japan becoming a leader in modern manufacturing principles. Later in life Deming published the book *The New*

Economics for Industry, Government, Education. Deming (2000) stated "the management of education, requires application of the same principles that must be used for the improvement of any process, manufacturing or service" (p. 6). His advice to schools included a need to stop ranking students, to stop comparing schools based upon scores, and to stop comparing schools based on athletics. He described the need to ask the customer to define what value looks like in the process. According to Womack and Jones (1996), lean thinking is always about "coming closer and closer to providing customers with exactly what they want" (p. 15).

Value. According to Carreira (2005), "value-added, in simplest terms, refers to activity that makes a product a more complete product" (p. 67). He argued the definition of value is always viewed through the eyes of the customer. In reference to higher education Balzer (2010) says "value is added when a process delivers the amount or level expected by the beneficiary, the quality the beneficiary expects, in as timely a manner as the beneficiary expects to receive it, and at a cost the beneficiary is willing to pay" (p. 127). If the student is viewed as one beneficiary of higher education, then the college textbook is one of many elements capable of adding value to their education. A textbook that adds value would prove to make higher education more complete. This is to say that students and faculty alike would perceive the text as a vital resource in the completion of their coursework.

Waste. In reference to waste, Carreira (2005) calls this "activity that does not advance the product to a more complete or finished state" (p. 68). From a lean manufacturing perspective, there are seven examples of waste: transportation, inventory, movement, waiting, over-production, over-processing, and defects (Carreira, 2005). According to Balzer (2010) examples of waste in higher education include aspects of a process:

- for which the beneficiary is unwilling to pay (e.g. high cost, substandard, on-campus housing);

- that result from an inconsistent process (e.g. professors covering different material in a required course);

- that overburden those involved in the process (e.g. the additional fields in the new course management system were unnecessary and unwanted by end users).

From a textbook perspective, examples of waste include textbooks that are purchased but not used, textbooks that appear irrelevant to the course material or textbooks that are perceived to have a low return on investment (ROI).

Summary

The world continues to demand highly-skilled workers in turn demanding more and more out of our higher education system. Previous research shows college faculty consistently supplement their courses with a textbook to provide structure and support to their students (Lichtenberg, 1992). The cost of the college textbook has risen dramatically causing as many as one-third of college students to consider going without one or more required textbooks (Joseph, 2015).

Ramsden (2003) stated "good teachers down the ages have continually used what they learned from their students to improve their practice" (p. 8). He described "learning as a quantitative increase in knowledge" (p. 28). Considering teaching effectiveness from the student's point of view offers colleges and universities evidence-based opportunities to improve the learning environment from a return on investment perspective (Ramsden, 2003).

Faculty and students differ greatly on the value and expectations associated with the current textbook model (Jones, 2011). As the textbook model continues to evolve, lean manufacturing principles will prove valuable in identifying value and waste with the overall goal of determining the extent to which textbooks are being used to support and enrich the teaching and learning process within selected CTE programs.

Chapter III: Methods and Procedures

In a highly sophisticated global economy higher education is more important than ever. Unfortunately higher education can be very expensive with the ever increasing cost of tuition, fees and textbooks. Textbooks require a significant monetary investment especially in the context of career and technical education. There is limited research on faculty and student perceptions regarding textbook return on investment.

Specifically the research design was selected to address the following research questions:

1. To what extent are textbooks adding *value* to the teaching and learning process from the perspective of students enrolled in selected CTE programs?

2. To what extent is there *waste* relative to the roles that textbooks can play in the teaching and learning process from the perspective of students enrolled in selected CTE programs?

3. To what extent are textbooks adding *value* to the teaching and learning process from the perspective of faculty in selected CTE programs?

4. To what extent is there *waste* relative to the roles that textbooks can play in the teaching and learning process from the perspective of faculty in selected CTE programs?

The following research methodology was used to determine the extent to which textbooks are being used to support and enrich the teaching and learning process within selected CTE programs.

Research Methodology

In order to ascertain a breadth of perspectives, a qualitative approach was used to gather information on textbook perspectives within the manufacturing department at Dunwoody College of Technology. Greenbaum (1998) found focus groups are a valuable tool "to collect

information about how target consumers feel about different products, services and programs"
(p. 11). For the purpose of this study, *Full group* sessions were conducted with two different
groups of stakeholders during spring semester of 2018. Greenbaum (1998) defines a full group
session as consisting "of a discussion of approximately 90 to 120 minutes led by a trained
moderator, involving 8 to 10 persons who are recruited for the session based on their common
demographics" (p. 2).

The purpose of focus group research was to facilitate disclosure. The capacity for
participants to feel safe among peers allows them to validate, build upon, trigger, and even
contradict each other at times (Krueger & Casey, 2009). For this study, a questioning route was
selected over a topic guide primarily because it has been shown to foster consistency as the
questions were pre-thought-out providing stability between the individual groups. Appendix B
shows the sequence of open-ended questions that were developed to evoke conversation and
gather information on the topic. Opening, introductory and transitional questions were utilized to
drive the conversation towards key and ending questions for analysis (Krueger & Casey, 2009).
A pilot of the focus group model was conducted prior to the actual study being conducted in
spring semester 2018. This pilot group assisted in questioning sequence, timing and order.

Subject Characteristics and Selection

The population for this study consisted of 15 faculty members and 247 students from
Dunwoody's manufacturing department during spring semester 2018. The first group included
Dunwoody students who were enrolled full-time in one of the following associate degree
programs: Automated Systems & Robotics, Electronics Engineering Technology, Machine Tool
Technology, Engineering Drafting & Design and Welding & Metal Fabrication. The second focus
group included faculty teaching in Dunwoody's manufacturing department. Faculty were
required to have at least one full year of teaching experience while utilizing one or more

textbooks in their courses. The selection process involved a sequence of progressive screens to help ensure the participants fit the needs of the study while remaining representative of the population (Krueger & Casey, 2009).

Screen 1: Student characteristic pool. Screen 1 was used to determine as precisely as possible the required characteristics of a student focus group participant. Students eligible for the study were enrolled in a manufacturing-related associate of applied science (AAS) degree and at least 12 credits during the spring semester of 2018. In addition to those requirements, the following table represents student characteristics used to ensure students from each of the key demographics were represented in the focus group. See Table 2.

Table 2

Student Focus Group Characteristic Pool

Program Area	Traditional	Non-traditional	Male	Female	White	Non-white
Electronics	25	6	30	1	26	5
Engineering	50	21	58	13	53	18
Machine Tool	32	11	40	3	35	8
Robotics	46	18	60	4	52	12
Welding	30	8	32	6	31	7

Note. There are 247 total students in Dunwoody's Manufacturing Department

Screen 2: Faculty characteristics pool. Screen 2 was used to determine as precisely as possible the required characteristics of a faculty focus group participant. Faculty eligible for the study taught one or more courses in a manufacturing-related AAS degree, utilized at least one textbook and had at least one full year of teaching experience. In addition to these requirements, Table 3 was used to ensure faculty from each of the key demographics were represented in the faculty focus group.

Table 3

Faculty Focus Group Characteristic Pool

Program Area	Male	Female	Degree Level < 4-year	Degree Level ≥ 4-year	Experience ≤ 5 years	Experience > 5 years
Electronics	2	0	2	0	0	2
Engineering	2	0	1	1	1	1
Machine Tool	4	0	2	2	2	2
Robotics	3	1	1	3	0	4
Welding	2	1	2	1	1	2

Note. There are 15 full-time faculty teaching in Dunwoody's Manufacturing Department

Screen 3: Subject selection. A list of students enrolled in the selected programs was obtained from the Registrar. The list also identified the appropriate faculty members to consider. Once the pools of faculty and student candidates were complete, a stratified random sample was taken from each pool to select focus group participants. For students, the process involved sorting into groups; traditional/non-traditional, white/non-white and male/female. A computer-generated random number was applied to select two participants from each group. Krueger and Casey (2009) found a common practice was to invite a slightly larger number of participants than

needed. In this case, 12 students were invited to each focus group with an expectation that 8-10 students would actually participate. A similar method was used with faculty groups; male/female, white/non-white and teaching experience level were considered. Again a computer-generated random number was applied to select two participants from each group. Krueger and Casey (2009) recommend the "ideal size of a focus group for most noncommercial topics is five to eight participants" (p. 67). By limiting group size to 8 participants, each participant was given adequate time to share their insights and experiences (Greenbaum, 1998; Krueger & Casey, 2009).

Using the selection processes described above, invitations were emailed to each group of students and faculty respectively. Responses to the emails were slow at first resulting in only 12 student participants confirming their participation one week prior to the scheduled focus groups. In order to guarantee full participation and representation, students and faculty were also approached in person. This process resulted in 16 student participants and 8 faculty participants ensuring adequate representation from both groups. To encourage participation, all student and faculty participants received a $25 bookstore gift card.

Instrumentation

All participants were asked to consent to participate in the focus group prior to opening the session (see Appendix F). Participants were reminded that whether or not they decided to participate, they were free to withdraw at any time without affecting their relationship to the college. A copy of the University of Wisconsin-Stout's Institutional Review Board (IRB) study approval can be found in Appendix D.

Prior to questioning the focus groups, goals for the process were explained and a broad definition of value and waste as it pertains to lean manufacturing was provided to each group. Validity of the questions used in the focus groups were established through a review of literature,

while a pilot focus group was conducted with a smaller group of students and faculty to ensure the tool was clear, easy to understand and that the questions aligned to the research questions.

Data Collection Procedures

Focus groups were conducted in the Anderson Room on the Dunwoody campus, guided by the questions in Appendix B. This space was selected because it provided a quiet and comfortable space that was appropriate in size. Each session was transcribed with the following information prior to commencing: name of the study, date and time of the session, type and number of participants, location and moderator name (Krueger & Casey, 2009). Participants were reminded that the goal of these questions was to spur conversation. The entire proceedings were recorded using an audio recording device and supplemented by researcher field notes. An objective moderator/assistant provided assistance in setting up recording devices and taking additional field notes to ensure input from all participants was captured. Audio transcriptions and field notes were sent off to a third-party for final transcription. Faculty and student focus group interviews were transcribed separately and printed on different colored paper with each line of the transcript numbered.

Data Analysis and Coding

A classical analysis of the transcription and field notes was used. Faculty transcripts were printed on green paper, while student transcripts were printed on gold paper. The scissor and sort method was used to cut out specific responses to questions that were directly related to the research questions. Coded information included quotes, phrases, sentences and conversations grouped by similarity and guided by their applicability to individual research questions. As the transcripts were analyzed each comment or train of thought was categorized into either a new code, existing code or discard pile (Krueger & Casey, 2009). Comments that were discarded were kept and revisited at a later time to ensure nothing was missed.

In addition to response similarities, emphasis was also placed upon frequency, specificity, emotion and extensiveness (Krueger & Casey, 2009).

1. **Frequency** – More attention paid to how often something is said

2. **Specificity** – More emphasis given to comments that give greater detail

3. **Emotion** – More weight given to Patterns where participants showed greater emotion

4. **Extensiveness** – Unlike frequency, extensiveness involves how many people said something

Limitations

Focus groups can produce trivial results at times when groups are too large or the topic is too complex (Krueger & Casey, 2009). Limiting the focus group size to eight participants helped spur conversation without allowing the comments to become superficial (Greenbaum, 1998). Another issue with focus group inquiry can be allowing dominant individuals to influence the results (Krueger & Casey, 2009). By laying out ground rules that included the fact that everyone was an expert, shy participants, ramblers and dominant individuals were allowed an equal voice at the table (Krueger & Casey, 2009).

Timeline

The following timeline was created to show the planning, implementation and follow-through necessary to complete the study. See Figure 2.

Implementation	Apr 2018	May 2018	Jun 2018	Jul 2018
IRB Approval	X			
Communication	X			
Preparation	X			
Meetings		X X		
Data Analysis		X X	X	
Report Writing			X X	
Editing			X	X
Presentation				X

Figure 2. Implementation timeline.

Summary

Focus groups have been used for decades to determine customer satisfaction with products and processes (Krueger and Casey, 2009). This study required participants to self-disclose their positive and negative experiences associated with textbooks in selected CTE programs. According to Balzer (2010) focus groups provide "useful insights into what expectations of value they had from the process and whether those expectations were met" (p. 134). The greatest benefit of the focus group approach used in this study was the opportunity to sit down with the key stakeholders and openly discuss their experiences with the current textbook model. Krueger and Casey (2009) state "the goal is to create comfortable, permissive environment" (p. 6). In doing so, the questions in Appendix B drove a conversation where the perspectives of two different groups, faculty and students, could be reported and ultimately answer the research questions designed for this study.

Chapter IV: Presentation of the Findings

Focus group research allows the researcher to listen and gather opinions and perceptions from similar types of participants to identify trends and patterns (Krueger & Casey, 2009). This study intended to uncover perceptions concerning how students and faculty feel about the current textbook model used in higher education. More specifically the participants involved in this study were students and faculty from the Manufacturing Department at Dunwoody College of Technology in Minneapolis, MN. By looking at the textbook from a value-waste perspective, new approaches for textbook adoption and deployment can be identified and recommended for implementation. The following research questions guided this study:

1. To what extent are textbooks adding *value* to the teaching and learning process from the perspective of students enrolled in selected CTE programs?

2. To what extent is there *waste* relative to the roles that textbooks can play in the teaching and learning process from the perspective of students enrolled in selected CTE programs?

3. To what extent are textbooks adding *value* to the teaching and learning process from the perspective of faculty in selected CTE programs?

4. To what extent is there *waste* relative to the roles that textbooks can play in the teaching and learning process from the perspective of faculty in selected CTE programs?

Participant Demographics

Participants were selected from current Manufacturing Department students and faculty at Dunwoody College of Technology in Minneapolis, Minnesota. In order to obtain a breadth of perspectives two student focus groups of 8 participants each were conducted during spring semester 2018. By limiting group size to 8 participants, each participant was given adequate time

to share their insights and experiences (Greenbaum, 1998; Krueger & Casey, 2009). A stratified random sample was used to ensure age, gender, ethnicity and academic major were fully represented in the sample. Table 4 displays the demographic data for the 16 student participants.

Table 4

Student Focus Groups Demographics

Program area	Traditional	Non-traditional	Male	Female	White	Non-white
Electronics	2	1	3	0	1	2
Engineering	1	1	0	2	2	0
Machine Tool	4	1	5	0	5	0
Robotics	3	1	3	1	3	1
Welding	1	1	1	1	1	1

Note. There were 247 total students in Dunwoody's Manufacturing Department

In order to obtain a breadth of perspectives one faculty focus group of 8 participants was conducted during spring semester 2018. Efforts were made to obtain a mix of major areas, ethnicity, gender, teaching experience and degree level as shown in Table 5.

Table 5

Faculty Focus Group Demographics

Program Area	Male	Female	Degree Level < 4-year	Degree Level ≥ 4-year	Teaching Experience ≤ 5 years	Teaching Experience > 5 years
Electronics	1	0	1	0	0	1
Engineering	3	0	1	2	2	1
Machine Tool	1	0	1	0	1	0
Robotics	1	1	0	2	0	2
Welding	1	0	1	0	1	0

Note. There are 15 full-time faculty teaching in Dunwoody's Manufacturing Department

Student Group Findings and Analysis

Five hours of focus group sessions were conducted that generated more than 90 pages of transcripts. The open-ended focus group questions used in the study yielded significant discussion requiring many hours of coding. A classical analysis of the transcription and field notes was used. Building on the work of Krueger & Casey (2009), a four-question flow chart was created to assist with the sorting of responses and creation of categories/codes for similar responses. See Figure 3.
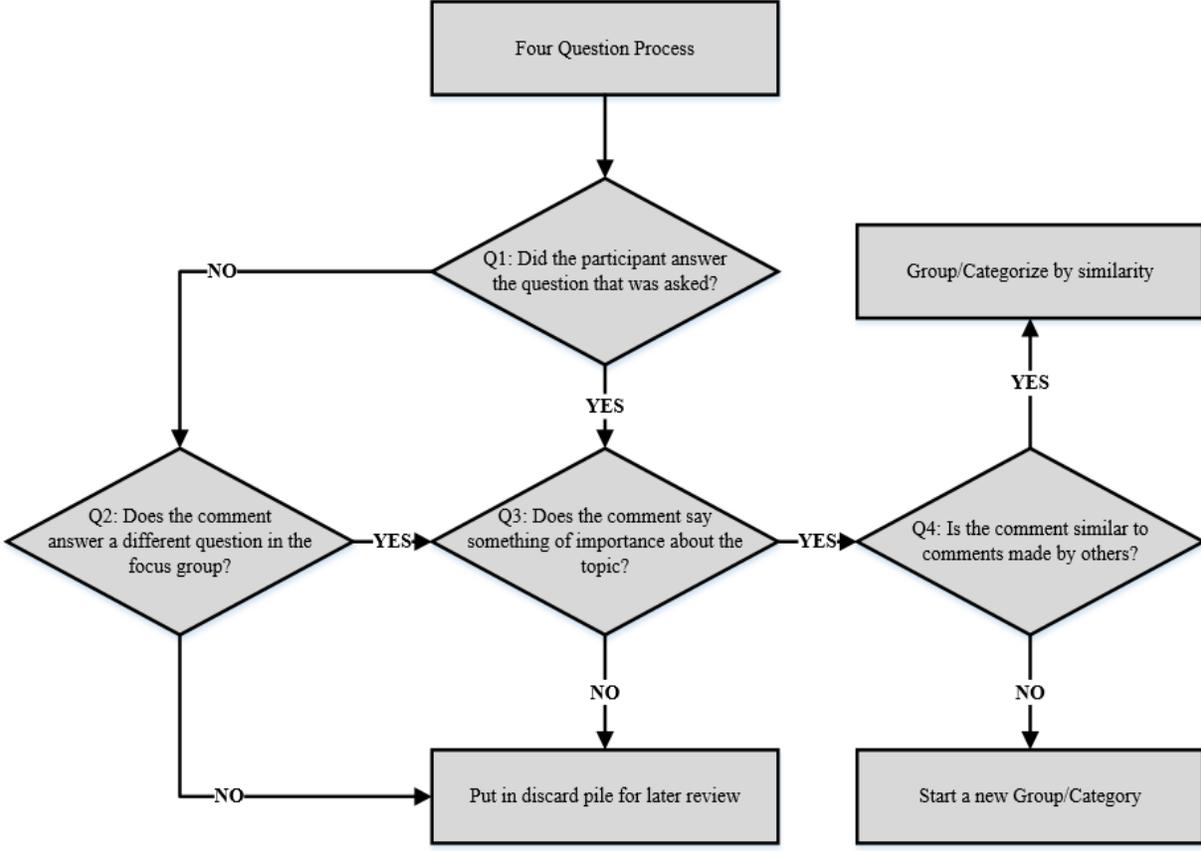
Figure 3. Four question flow chart.

These categories of similar responses were used to generate the codes shown in Table 6.

Table 6 shows the codes, number of responses for each student focus group and total responses

for all student focus groups.

Table 6

Student Focus Groups Codes and Responses

Code	Code Definition	Group 1 Responses	Group 2 Responses	Total Responses
CT	Textbook Cost	31	32	63
UN	Textbook Underutilized or Low Value	26	31	57
GU	Good Utilization of a Textbook	28	28	56
AV	Availability of the Textbook	27	22	49
OM	Other/New Textbook Model	15	23	38
OR	Resources other than a Textbook	19	11	30
PQ	Poor Quality Textbook	11	13	24
AP	Textbook as an Additional Perspective	9	11	20
CF	Confusion created by the Textbook	6	5	11
NE	New or Different Edition of Textbook	5	2	7
CR	Curriculum/Course Development	1	1	2

The following student group findings have been organized by focus group question and identified with common codes related to the quotes generated by that question.

Student group question 1. How do you currently obtain/purchase the textbooks needed for your coursework? Codes generated: CT, UN

The students were split on methods used to acquire the textbooks needed for class. The split was equal between those that purchased them from the bookstore and those that purchased them online. All but one student stated they preferred renting or purchasing used textbooks to save money. Further probing showed that not all students purchased all of the books listed as

required for class. Several students referred to cost of books that may or may not get used. For example, one Electronics student stated, "I like to wait 2-3 weeks to see if the book is really needed before I spend my money … that's rent or food for the whole week, I'm not spending money unless I need to … in many of my classes I can get by without buying the textbook."

Student group question 2. How do you feel about the current textbook model? Codes generated: CT, AV, UN, NE, PQ

This question generated many student concerns regarding the availability of the textbook in the college bookstore. A first year Robotics student said "I've had three or four classes needing a book and the bookstore not having it … if you don't come in weeks and weeks before school starts they're all gone and you fall behind on class work." In addition to availability, students also described concerns about the edition of the textbook. Concerns included the inability to sell a textbook back to the bookstore at the end of the semester because of the edition or students in class having the wrong edition as delivered from Amazon.com.

One of the larger concerns for students was underutilization of the textbook in their coursework. A Machine Tool student described his experience purchasing his world geography textbook by stating, "I bought the textbook and I haven't even opened it. I don't know what to use it for." Other concerns included textbooks that were poor in quality or riddled with errors.

Student group question 3. Why are textbooks important to the successful completion of your coursework? Codes generated: GU, AP, OR

The general consensus of the group was that many of their textbooks proved to be valuable resources in the course of their studies. Numerous students echoed the comments of a Machine Tool student who said, "The textbook is an additional reference I can look at when I'm not in class. It can be helpful when the instructor is not available." Students also described trade and technical manuals such as the *Machinery Handbook* or *National Electric Code* as the most

important books they have. Several students directly mentioned the *Machinery Handbook* with comments similar to an Engineering Design student who said it was "the most important reference we have for anything from design to manufacturing."

Students also described other resources such as tutorials and videos as just as important as the textbook. Many comments were made similar to this Robotics student: "I don't prefer to read … my instructor created YouTube videos to assist with the homework problems in the textbook … this really helps us." Several students described their Solidworks textbook as an excellent model. This was well-stated by a Machine tool student who said "the Solidworks textbook is more of a workbook that utilizes example parts and step-by-step tutorials in each chapter." An Engineering Design student described this model as "a cookbook of recipes on how to make parts … this is why we came to Dunwoody, we want to learn how to make things."

Student group question 4. What aspects of the textbook model do you find important or beneficial? Codes generated: GU, OR, AP, OM

Students found illustrations, images and step-by-step examples to be most important in a textbook. As a Machine Tool student described, "We don't have every type of machine at Dunwoody so the chance to see what a different control looks like is valuable." Other models such as e-textbooks came up during this discussion as well. An Electronics student described this experience by saying "I prefer renting an e-book whenever I can … It's on my laptop and I can text search for the information I need without lugging heavy books in my backpack." Several students described the textbook as an additional perspective that supplements instruction. A Robotics student described his instructor's use of the text as "he could teach us without the book, but the book is an added tool to help him teach us better … that's the difference."

Students described the use of technical manuals that were similar to those used in industry as valuable to their coursework. A Machine Tool student described, "I spent $80 on my

Machinery Handbook, but considering the massive amount of information that's in there, I will keep it for the rest of my life. This is by far my most valuable tool."

Student group question 5. Describe a time when the textbook was either not utilized or did not add value to the coursework. Codes generated: CF, UN, PQ

Students in both groups described cases where textbooks were rarely used. In some courses it seemed as if the textbook was only there to provide homework questions. Many students described faculty as "requiring books that they want us to have, but we really don't need." One Engineering Design student describes "for some of my classes we got reference books that were on our list of books to get, but we really didn't need them … they were more for our future work in the field."

Some students described textbooks as confusing. The general consensus was that authors try to show off their knowledge through dense readings and limited examples. An Electronics student stated it best: "It's confusing because its written as a philosopher view and not someone normal … I can't even read the thing." Other sources of confusion included instruction that bounced around in the textbook. Several students described their dismay with customized textbooks that include chapters from several different textbooks. One Welding student described her experience with a custom text as "it's very confusing … we'd go from chapter 24 to chapter 2 then somewhere in the middle nothing lined up … the page numbers, table of contents and index were all wrong." When it comes time to sell back customized textbooks, several students commented that "the bookstore rarely buys them back unless the exact same course it taught in the following semester."

Student group question 6. How would you describe the cost of textbooks from a return on investment perspective? Codes generated: CT, OR, AV, UN

By far the greatest concern shared by the student participants was the high cost of textbooks. Student participants agreed that they prefer to purchase books online to save money. For some students however, the only option was the bookstore because of financial aid. When asked why more students don't go through Amazon or Chegg, one Machine Tool student described the situation, "I'm kinda handcuffed to the bookstore, I can't afford school as it is, so while I'm waiting for my financial aid to come through the bookstore would allow me to charge my books." Another concern was the disparity between student purchase price and bookstore buy-back price at the end of the term. An example of this was described by an Electronics student "I purchased the book used in the bookstore for $60 and at the end of the semester they offered me $6 to buy it back … for $6 I'd rather hand it to a student that needs it next semester."

Students described their use of the textbook more like skimming for information rather than reading. One Electronics student described this by saying "I don't actually read the chapter … most of the time, I'm just searching for a little passage or bit of information and then move on to the next part."

Student group question 7. If you could recommend improvements to the current model for textbooks, what would they be? Codes generated: CT, OM, GU

The general consensus from student participants was that the current textbook model is broken and there has to be a better way. The library was discussed as a potential solution to the problem. Some students asked if the library could house the textbooks needed for class and students could check them out at the beginning of the term and return them at the end. Additional conversations included Dunwoody's current laptop model where computers are issued to students on the first day of class with all program specific software pre-loaded. Several students described the notion of an e-library; "Why couldn't the library host the textbooks electronically so I could log in and view my textbook … no more waiting in line or starting class without what

I need." The majority of the students had tried e-books and wondered why they are not utilized more often. One student asked the group, "When was the last time any of you checked out a book from a library? The school already gives us a laptop and software, why couldn't the laptop have access to an online library with our textbooks." Specifically, the Manufacturing Department students see great value in the current laptop program and would like the college to build on this successful model.

Faculty Group Findings and Analysis

Similar to the approach used with the student groups, categories of faculty responses were used to generate the codes shown in Table 7. Faculty transcripts were printed on green paper, while student transcripts were printed on gold paper. The same four question process used to sort student responses was also applied to faculty responses (Krueger & Casey, 2009). See Figure 3.

Table 7 shows the codes and total number of responses for the faculty focus group. Further analysis included looking at each focus group question by identifying the common codes and related direct quotes generated by that question.

Table 7

Faculty Focus Group Codes and Responses

Code	Code Definition	Number of Occurrences
CT	Textbook Cost	34
CR	Curriculum/Course Development	32
OR	Resources other than a Textbook	27
AP	Textbook as an Additional Perspective	25
OM	Other/New Textbook Model	22
AV	Availability of the Textbook	21
GU	Good Textbook Utilization or High Value	17
UN	Textbook Underutilized or Low Value	12
NE	New or Different Edition of Textbook	9
DR	Students do not Read	7

Faculty group question 1. How do you currently research and adopt the textbooks needed for your coursework? Codes generated: CR, CT, AP

Manufacturing department faculty were primarily concerned with adopting a textbook that assisted in the development and delivery of coursework. Faculty also described the importance that language and terminology follow the course as closely as possible. An Engineering faculty member mentioned that, "by using a good textbook, it helps me set out the content, how much we're going to cover and how in depth to go." In addition to using the text to help guide the course, the textbook was also found to have additional examples and pre-worked

homework problems. Although not the primary concern, ensuring students could afford textbooks was also very important.

The ability for a textbook to provide an additional perspective to what happens in the classroom or laboratory was discussed at great length among faculty participants. A Robotics instructor declared, "When students go home at night they do not have access to their instructor. My hope is that they will read the book and look at the examples. Those who do always come in better prepared for the next lesson." There was additional discussion that textbooks can serve to better prepare students for industry certifications. Consider comments made by Machine Tool faculty members regarding National Institute for Metalworking Skills (NIMS) testing: "So many times the terminology and wording is important. By using a NIMS-certified textbook, we can ensure the lingo is the same between class and what they're going to see on a certification exam."

Faculty group question 2. How do you feel about the current textbook model? Codes generated: CT, OR, AV, NE, GU

Textbook cost and availability was a lengthy conversation among faculty. Faculty repeated several times that students need to have the book at the start of the semester to ensure success in the class. Some faculty described the need to adjust first week schedules to accommodate students that do not have the necessary textbooks. A senior Electronics instructor described his solution to the problem: "The first week of class can be difficult … students won't have the book or are waiting for it to come from Amazon. I copy the first two chapters of the book so everyone can get by until their books show up."

Department faculty described students as "quite savvy" in their attempts to get by without buying a textbook. Students have been found passing books down to students in the next semester, sharing one book among several students or in some instances downloading pirated

digital copies from the Internet. Although Amazon.com is by far the most popular vendor, Chegg.com has become increasingly popular. A Robotics instructor described a related problem "since students are getting books from all different areas – online, bookstore, other sources – I've had issues where they bought the wrong edition." Many instructors described their personal experiences with this as both a student and instructor.

Faculty group question 3. Why are textbooks important to the delivery of your courses? Codes generated: AP, DR, OR

Faculty described their desire for the textbook to supplement the instruction in class. A Robotics instructor described "the textbook will give additional insight … 70% of my students will get it from my explanation in class … what about the other 30% of students … the textbook provides an additional resource for them." Several faculty agreed with this thought with an additional caveat that students typically don't read what's assigned to them. An Electronics instructor described the problem this way: "We're a technical college and our students want to get their hands dirty … for the most part our students are not going to read what's assigned to them." The general consensus was that students skim the book only as necessary to get through homework assignments.

Faculty group question 4. What aspects of the textbook model do you find important or beneficial? Codes generated: AP, OR, GU

Several faculty members described the textbook as providing additional clout to what is being taught. A Welding faculty member described this by saying "it's kind of like proof right here on this page … like we talked about … see why this is important."

Some of the faculty described the textbook as vital to their success in their first semester. The group agreed with a newer faculty member's comment "I need to teach the basics and grow

the topics … the textbook does a lot of this work for me … I can go home each night and prepare for the next day's lecture using the textbook."

Several faculty mentioned the additional resources provided by the textbook as providing value to the coursework. An Engineering instructor described the test generator "it can be tough to come up with multiple choice questions and distractor answers … it's nice to reference the exam generator and find the questions I think will work well."

Faculty group question 5. Describe a time when the textbook was either not utilized or did not add value to the coursework. Codes generated: UN, CR, DR

Several faculty described books they required students to purchase even though the utilization would be low. The main reason for selecting such a book was to further support future careers by helping students build a library of resources. Some faculty described cases where books were selected for new courses taught for the first time and found to be excess or a poor fit. One Engineering faculty member described "the first time teaching a programming class I assigned two text books thinking I could get through more material than I wound up having time for … the second book was only used about 3-4 weeks out of the semester."

Faculty discussed at great length how students "crave grades." Several faculty members described that "it seems to be less about the material and more about the letter grade earned." An Electronics instructor described "if I want them to read the book, I've got to test them or quiz them on the chapter … this is the only way to get them to read." The general consensus was that the grade is more important than anything else and students want to know the minimum needed to get an "A." An Engineering instructor described his recent conversation with a student as "it's not how much you turn in, it's the quality of the work you're turning in."

Faculty group question 6. How would you describe the cost of textbooks from a return on investment perspective? Codes generated: CT, AV, OM

Faculty described the difficulty in finding a textbook that is fully utilized in their courses. The balancing act they described is cost versus quality/value. An Engineering faculty member describes "students are paying thousands of dollars in tuition … it doesn't seem unreasonable to expect them to buy a $150 textbook." Many faculty reflected on their own purchasing habits from when they were in school. The primary difference faculty described was availability of resources. A Machine Tool faculty member described "when I was in college, the internet wasn't around so I needed to purchase and have these resources not only for this class, but also for future classes … it seems modern students are more likely to Google questions over opening their textbook."

Faculty participants were very concerned and described that "students struggle to pay for their textbooks." A Welding faculty member described, "I had a classmate when I was studying welding who was about to quit because he didn't have the books … which was the most insane thing I'd ever heard." Just like students, faculty have become quite savvy at finding ways to help their students. An Electronics faculty member stated "I keep a few extra copies in my office for this very reason … If I know a student is really struggling I'll just hand him one and tell him to bring it back to me at the end of the semester … our secret."

Faculty group question 7. If you could recommend improvements to the current model for textbooks, what would they be? Codes generated: OM, CT, GU, AV

The most common concern Dunwoody faculty focus group participants stated "was the cost to attend Dunwoody." Students not only pay tuition, but also pay technology fees, device fees, graduation fees and activity fees. Just when they think they've figured out how to pay for college, they are told they need another $600 for textbooks from the bookstore. Similar to the student focus groups, faculty brainstormed several potential ideas to improve the model. A Machine Tool instructor asked, "Could the library stock a sufficient amount of textbooks for the

maximum amount of students we expect?" Faculty suggested the quantity buying power of the college could result in greater discounts on the textbooks even if the students were charged. The suggestion was made that this could be a huge "value-added" if it was rolled into the tuition model. The term all-inclusive tuition was brought up several times.

Faculty described many technologies that have been replaced electronically, paper maps, newspapers, postal letters, film cameras and even the checkbook. A Welding instructor described , "I think it's time for a completely different model … why not have an e-library where everything's available … do we even need a need a bookstore anymore?" This thought was echoed for a great period of time as faculty noted students are provided laptop computers by the college with all of the program-specific software needed for class. One faculty member mentioned "I've never had an issue with students not having a computer … Why … because it's provided and built into the tuition model."

Patterns of Perception

The graph in Figure 4 compares faculty and student participant responses by code for the 8 codes with the greatest number of responses. By presenting this data in a bar graph format, the identification of converging and diverging codes could be accomplished by comparing the height of the bars. For example, Manufacturing Department students and faculty had several converging patterns of value and waste as shown on Figure 4: textbook cost, good utilization, availability and other models. At the same time, students and faculty differed in their perception of textbook value and waste associated with underutilization, curriculum development and using the textbook as an additional perspective. Once these patterns were identified, further analysis included comparing these perceptions using direct quotes that were representative of the group involved.
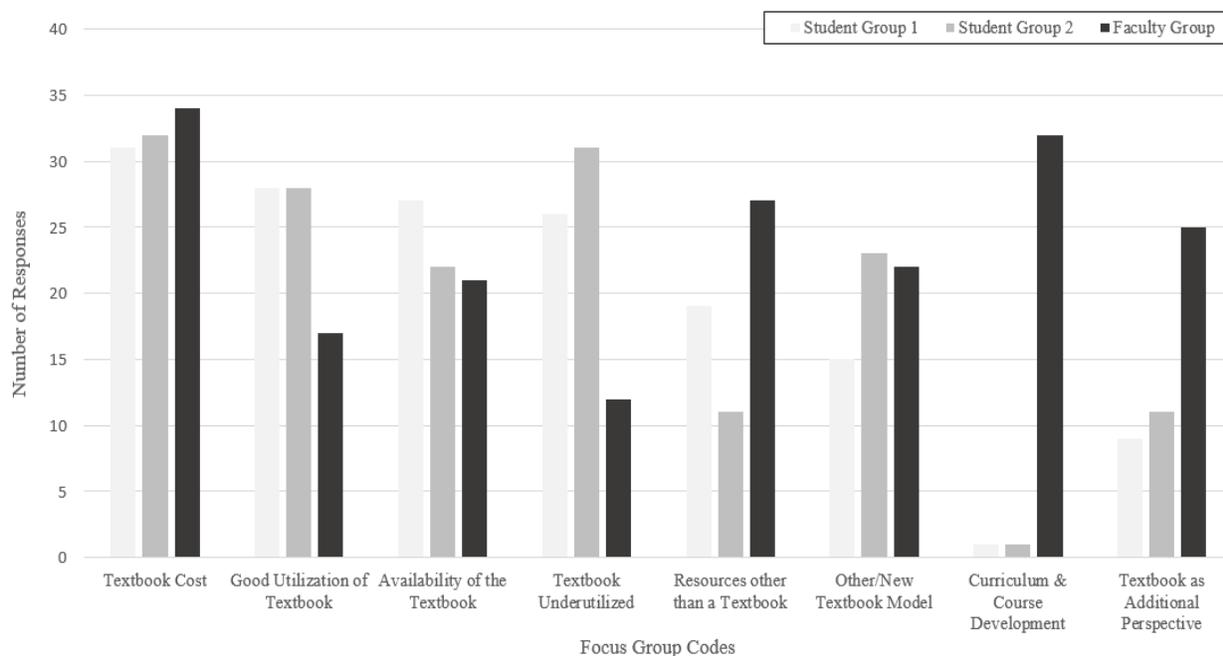
Figure 4. Comparing student and faculty responses.

Converging pattern 1: Textbook cost. Textbook cost was by far the most common topic discussed by all focus groups. Cost was mentioned by participants multiple times even when it wasn't directly related to the question. The first student focus group identified a textbook they had all been required to purchase for a humanities elective course. As the group discussed value and return on investment it was discovered that one member had paid $19 for the textbook that another had paid over $200. When asked why everyone doesn't purchase or rent books online, one Machine Tool student replied, "I'm kinda handcuffed to the bookstore, I can't afford school as it is, so while I'm waiting for my financial aid to come through the bookstore would allow me to charge my books."

Beyond cost, department faculty described the effect of not having a book during the first week of the semester. An Electronics instructor describes his solution to the problem: "The first week of class can be difficult … students won't have the book or are waiting for it to come from Amazon. I copy the first two chapters of the book so everyone can get by until their books show

up." Student and faculty participants both cited cost as the primary reason students do not have the book.

Although cost was the biggest concern for student and faculty participants when it comes to textbooks, textbook value was not determined purely by cost. Instead, many students described value as a return on investment of the textbook both towards their coursework and future careers. One Engineering Design student described return on investment as follows, "I've paid $5 for a book I never used and $200 for a book I still use today. It's not about the cost, it's more about how good of a resource it is. I am much happier spending a lot of money on something I value than $5 on junk."

A Robotics instructor described why she currently teaches without a textbook. She said "we teach three specific brands of programmable controllers and textbooks tend to be tied to one brand or the other. For now we are using the manufacturer's technical manuals instead of purchasing a book that is not a good fit."

Converging pattern 2: Good utilization. The Manufacturing students who participated in the focus groups found great value in their technical references. Technical references were described as manuals they would see out in the field. The technical nature of manufacturing curriculum relies on these manuals both for coursework and lab execution. One Engineering Design student described his Solidworks book by stating, "we received a workbook in our Solidworks class that was put out by Solidworks. The examples are step-by-step allowing you to work from home through the examples. There are also online videos to accompany the parts. I never would have made it through without these."

One of the student groups got into a discussion about manufacturing-related cookbooks. The best student description of this type of book was from a Machine Tool student who said, "when you build a cookbook you get a lot of individual recipes from lots of different people and

it's their particular way of doing something. We've got a lot of subject matter experts here, have them write these up, create videos or whatever." Department faculty mentioned several times the need for a textbook to support in-class coursework when students are working at home. One Engineering instructor described the process by saying, "I like to go over the theory and basic calculations during class. I then send students home with homework. The book usually includes additional examples they can look at while working on their homework."

      Converging pattern 3: Textbook availability. All three groups described concerns with students having the necessary books available for the start of classes. In many cases students arrived at the college bookstore with schedule in hand only to find out that they either had not yet received the textbook or had since ran out. This matter was described by an Engineering Design student this way: "if you don't come in weeks and weeks before classes start they'll run out and you fall behind on class work." This sentiment was echoed by several faculty focus group participants who described "the need to adjust first week schedules to accommodate students that do not have the necessary textbooks." A senior Electronics instructor described his solution to the problem: "The first week of class can be difficult … students won't have the book or are waiting for it to come from Amazon. I copy the first two chapters of the book so everyone can get by until their books show up."

      Faculty focus group participants described students as "quite savvy" in their attempts to get by without buying a textbook. Students have been found passing books down to the next semester, sharing one book among several students or in some instances downloading pirated digital copies from the internet. Although Amazon.com is by far the most popular place to get textbooks, Chegg.com has become increasingly popular. Chegg not only provides textbook rental, but also additional resources such as complete solutions manuals and even expert question and answer support. One Electronics student described his experience with Chegg, "I was told

about Chegg from another student and was not only able to rent the textbook, but I also received free access to their online complete solutions manual. It almost felt like cheating."

Converging pattern 4: Other models. The current textbook model used at Dunwoody College of Technology is for faculty to select textbooks to support their courses and submit orders to the college bookstore. The bookstore then compares enrollment and purchasing trends to predict the quantity of textbooks to stock in preparation for the upcoming semester. Students and faculty focus groups were asked for ideas on potential improvements to the current model. Several students described their preference for e-books. One Engineering Design student stated, "The e-book option allows me to save money on books and not have to lug a bag full of heavy books from class to class. I can download several to my laptop that the school provides and not have to worry about selling them back or returning them by a certain date." Another student asked the group, "When was the last time any of you checked out a book from a library? The school already gives us a laptop and software, why couldn't the laptop have access to an online library with our textbooks."

When asked to discuss other models, department faculty also came up with the idea of school-supplied textbooks. One Machine Tool faculty member commented, "Nobody checks out books from our library, why couldn't the library stock the books for every class and students could check them out at the beginning of the term?" Some discussion was given to the fact that some books should be purchased and kept for future use. Examples given were the *Machinery Handbook* and the *National Electric Code*. An Engineering Design instructor specified, "I see no reason why these can't be treated the same way. Make the books available but remind the students they really ought to buy this book in the future. It's quite possible that by the time they graduate a new version will be out anyways."

Similar to the converging patterns found, several diverging patterns were identified in Figure 4. The next section will discuss diverging patterns found between the student and faculty focus groups.

Diverging pattern 1: Underutilization. Underutilization was the second most common concern in the student focus groups appearing a total 57 times between the two groups. One Robotics student said, "For some reason two of the general course textbooks I needed last semester weren't available to rent and I had to buy them. One of them I never cracked open and the other I opened one time for an article I had to read. When I tried to return them to the bookstore, they wouldn't buy them back because those classes were not running the next term." An Electronics student mentioned, "The only time I use my textbook is when there's something assigned in the book like end of chapter questions."

Underutilization only showed up 12 times for the Manufacturing faculty, which suggested a diverging pattern when compared to the student responses. Some faculty described the need to utilize topics from one or more textbooks to fully cover the required course competencies. Faculty mentioned "the majority of our technical courses require more than one textbook which means we are selecting some topics from each book but not all." One Engineering faculty member described "the first time teaching a programming class I assigned two text books thinking I could get through more material than I wound up having time for … the second book was only used about 3-4 weeks out of the semester."

Diverging pattern 2: Curriculum & course development. The development of college-level courses and curriculum came up several times in the faculty focus group and only once in the student groups. When asked how the textbook adds value, faculty described the textbook as "vital when developing a new course." One Engineering faculty member said, "by using a good textbook, it helps me set out the content, how much we're going to cover and how

in depth to go." In addition to using the text to help guide the course, the textbook was also found to have additional examples and homework problems.

Other examples included technical manuals and codebooks used in and out of the classroom. Faculty describe these references more like a tool than a book. One faculty member described, "the *Machinery Handbook* is the one book that a machinist will keep the rest of their life. 65 dollars for that much information is a steal." Many of these books become the go-to manual in the lab spaces. Machinists in the machine shop or designers using CAD software all look to these guides to design and build.

Diverging pattern 3: Textbook as an additional perspective. The ability for a textbook to provide an additional perspective was discussed extensively among faculty, but was not as apparent to the students. Faculty described the textbook as an additional instructor. One Robotics instructor stated, "when students go home at night they do not have access to their instructor. My hope is that they will read the book and look at the examples. Those who do always come in better prepared for the next lesson."

In addition to serving as an additional perspective, textbooks can also serve to better prepare students for industry certifications. Consider the comments made by Machine Tool faculty members regarding National Institute for Metalworking Skills (NIMS) testing: "So many times the terminology and wording is important. By using a NIMS-certified textbook, we can ensure the lingo is the same between class and what they're going to see on a certification exam."

Summary

Manufacturing Department faculty and students agree that textbooks are important to student success. Students who wait or fail to obtain the textbooks needed for class find themselves falling behind in courses and struggling to catch up. There are many reasons students

fail to obtain the textbooks necessary for class. While the primary reason students don't have the necessary textbooks is cost, some students also describe a desire to wait to purchase to see if the textbook is truly going to be needed. All focus groups suggested new models for college textbooks. Students tended to point towards e-resources as a potential solution to the problem, while faculty seemed to promote a library of textbooks available for check out.

Textbook cost is not trivial with some studies showing textbook cost can increase the total cost of attendance by as much as 26% (Redden, 2011). When it comes to textbook cost, this study found that a single book can vary in price by hundreds of dollars between renting, purchasing, new, and used and e-book options. Several students blamed the problem on the current financial aid model. Students struggling to pay for college found themselves tied to the college bookstore for textbooks as they waited for financial aid distributions. By limiting access to the college bookstore, purchasing options are limited to only those options on-hand. Many times this results in students purchasing a $200 new textbook instead of lower cost rental or e-book options.

Students described at great length concerns that some courses required a textbook that was underutilized. One of the key tools used to combat underutilization and cost is to wait to buy the textbook. At the same time, one of the biggest complaints faculty have is students that do not have the resources needed for the first day of class. Faculty admit to asking students to purchase books that they may not require for coursework, but instead feel as if they are necessary to build a professional library.

Focus group participants were most engaged with the opportunity to recommend improvements to the current textbook process. Several pointed to Dunwoody's laptop lease program as a good example of ensuring students have what they need for class. Dunwoody issues each Manufacturing student a laptop with all of the program-specific software required for class.

It's rolled into the tuition as a fee, but students never go without what is the primary tool for most technical programs. Faculty described a model where the library could stock all of the textbooks needed and students would simply check them out for the term and return them at the end. Students described a similar model, but preferred a system of e-books accessible from their laptop. The advantages of the e-book model became apparent as students discussed they already have a laptop and have no desire to carry a heavy stack of textbooks on top of that.

The focus group research methodology used in this study allowed for open dialog regarding the textbook model used in the manufacturing programs at Dunwoody College of Technology. Faculty and students both identified value and waste associated with the textbook process. In doing so, these groups also tried to identify how to leverage what was and was not working while generating ideas on how to improve. Both groups identified the textbook as a valuable resource that was available outside of the classroom designed to give an additional perspective on the course material. The groups also identified that even though a student pays their tuition on time, there may be other constraints preventing them from being ready for class on day 1. Students have shared textbooks, photocopied textbooks and even downloaded pirated PDF versions from the internet to get by. Faculty described keeping a few extra office copies around, photocopying the first few chapters or placing reference copies in the library.

Chapter V: Summary, Conclusions and Recommendations

Focus group research allows the researcher to listen and gather opinions and perceptions from similar types of participants to identify trends and patterns (Krueger & Casey, 2009). This study intended to uncover perceptions concerning how students and faculty feel about the current textbook model used in higher education. More specifically the participants involved in this study were students and faculty from the Manufacturing Department at Dunwoody College of Technology in Minneapolis, MN. By looking at the textbook from a value-waste perspective, new approaches for textbook adoption and deployment can be identified and recommended for implementation.

This chapter includes a discussion of the major findings as they relate to the literature on the role, purpose, value and waste associated with the use of textbooks in higher education. The chapter concludes with a discussion of recommendations on how to apply the results and opportunities for future research. The following research questions guided this study:

1. To what extent are textbooks adding *value* to the teaching and learning process from the perspective of students enrolled in selected CTE programs?

2. To what extent is there *waste* relative to the roles that textbooks can play in the teaching and learning process from the perspective of students enrolled in selected CTE programs?

3. To what extent are textbooks adding *value* to the teaching and learning process from the perspective of faculty in selected CTE programs?

4. To what extent is there *waste* relative to the roles that textbooks can play in the teaching and learning process from the perspective of faculty in selected CTE programs?

To answer these questions, a focus group research methodology was used to allow for open dialog regarding the current textbook model. Two separate student focus groups of 8 participants each and one faculty group of 8 participants were selected using a stratified random sample. Focus group sessions were led by a trained moderator with the intent to evoke conversation and gather information on the topic. Appendix B shows the sequence of opening, introductory and transitional questions that were utilized to drive the conversation towards key and ending questions for analysis (Krueger & Casey, 2009). All sessions were audio recorded and transcribed for processing.

A classical analysis of the transcription and field notes was used. Responses were categorized using the four question process shown in Figure 3. These categories were then clustered and renamed using the short codes found in Table 6 and Table 7. These codes were compared to the research questions and against the responses from the other focus groups to analyze perceptions of textbook value and waste in the manufacturing programs at Dunwoody College of Technology. In addition to response similarities, emphasis was also placed upon comment frequency, specificity, emotion and extensiveness (Krueger & Casey, 2009).

Summary

The goal of this study was to uncover perceptions concerning how students and faculty feel about the current textbook model. The findings of this study can be used by college faculty and administrators to inform efforts and better utilize resources that support and enrich the learning process. By looking at the textbook from a value-added perspective, new approaches for assessment, faculty development, textbook adoption and deployment can be identified and recommended for implementation.

Significant results of this study can be found by looking at the eight codes with the greatest total number of responses. These responses have been grouped and summarized below according to research question.

Research question 1. To what extent are textbooks adding *value* to the teaching and learning process from the perspective of students enrolled in selected CTE programs?

Students found the textbook to be important to their success by providing an additional perspective available outside of the classroom. Numerous students echoed the comments of a Machine Tool student who said: "the textbook is an additional reference I can look at when I'm not in class, it can be helpful when the instructor is not available." Horsley et al., (2010) found that "students report less preference for lengthy textbooks and readings, preferring especially lecture notes, web resources and 'dummies' guides to a specific assessment task" (p. 58). Dunwoody students specifically mentioned the value of additional resources such as step-by-step tutorials and YouTube videos. Industry references such as the *National Electric Code* and the *Machinery Handbook* were also seen as adding great value as these are the very tools students will use upon entering the workforce.

Students described value associated with Dunwoody's current model for issuing students laptops with industry specific software and rolling the cost into the tuition model. This model provides great opportunity for students to take advantage of lower-cost e-book rentals as offered in the college bookstore. An Electronics student stated it best when he said: "I prefer renting an e-book whenever I can … It's on my laptop and I can text search for the information without lugging heavy books in my backpack." Students would like to see e-book services like this expanded.

Research question 2. To what extent is there *waste* relative to the roles that textbooks can play in the teaching and learning process from the perspective of students enrolled in selected CTE programs?

Martin et al., (2017) found the most common complaints students had in reference to textbooks included: limited bookstore purchasing options, limited classroom use and updated versions. Although cost was the most common discussion point for the focus groups at Dunwoody, many students described the underutilization of a textbook coupled with high cost as a greater concern. This sentiment was represented by statements similar to this Electronics student who said "I like to wait 2-3 weeks to see if the book is really needed before I spend my money … that's rent or food for the whole week, I'm not spending my money unless I need to … in many of my classes I can get by without buying the text book."

Students also described issues with textbook availability in the college bookstore. Concerns included books that hadn't yet arrived or have sold out. A Robotics student described this issue by saying: "I've had three or four classes needing a book and the bookstore not having it … if you don't come in weeks and weeks before school starts they're all gone and you fall behind on class work." The majority of students enjoyed the array of purchasing options provided online through websites like Amazon and Chegg. When asked why more students don't purchase or rent books online, one Machine Tool student replied, "I'm kinda handcuffed to the bookstore, I can't afford school as it is, so while I'm waiting for my financial aid to come through the bookstore would allow me to charge my books."

Research question 3. To what extent are textbooks adding *value* to the teaching and learning process from the perspective of faculty in selected CTE programs?

Faculty described the important role that a textbook plays in the development and delivery of coursework. Textbooks serve to represent the collective information available in a

certain topic area or profession (Berry, Cook, Hill & Stevens, 2010). An Engineering faculty member described this when he said: "by using a good textbook, it helps me set out the content, how much we're going to cover and how in depth to go." In addition to using the text to help guide the course, the textbook was also found to have additional examples and pre-worked homework problems. Some faculty described the textbook as vital to their success in their first semester. The group agreed with a newer faculty member's comment "I need to teach the basics and grow the topics … the textbook does a lot of this work for me … I can go home each night and prepare for the next day's lecture using the textbook."

The ability for a textbook to provide an additional perspective to what happens in the classroom or laboratory was discussed at great length among faculty participants. A Robotics instructor declared: "When students go home at night they do not have access to their instructor. My hope is that they will read the book and look at the examples. Those who do always come in better prepared for the next lesson." There was additional discussion that textbooks can serve to better prepare students for industry certifications. These ideas were echoed by a Machine Tool instructor who commented: "So many times the terminology and wording is important. By using a NIMS-certified textbook, we can ensure the lingo is the same between class and what they're going to see on a certification exam."

Faculty described the tremendous value associated with Dunwoody's current model for issuing students laptops with industry specific software and rolling the cost into the tuition model. One faculty member said "I've never had an issue with students not having a computer … Why … because it's provided and built into the tuition model."

Research question 4. To what extent is there *waste* relative to the roles that textbooks can play in the teaching and learning process from the perspective of faculty in selected CTE programs?

The *Chronicle of Higher Education* reported 70% of college students have skipped buying a required textbook due to cost (Redden, 2011). Dunwoody faculty described students as "quite savvy" in their attempts to get by without buying a textbook. Students have been found passing books down to the next semester, sharing one book among several students or in some instances downloading pirated digital copies from the internet. Several faculty focus group participants described "the need to adjust first week schedules to accommodate students that do not have the necessary textbooks." One instructor described his solution to the problem when he said, "The first week of class can be difficult, students won't have the book or are waiting for it to come from Amazon. I copy the first two chapters of the book so everyone can get by until their books show up."

Burgraff (2016) found textbook costs "have gone up by 800 percent" (p. 48) in the past 30 years. The most common concern for Dunwoody faculty and students was textbook cost. Faculty described that students struggle to pay tuition and fees only to discover during the first week of class they need another $600 for textbooks. Faculty questioned the value of the paper textbook by describing how many technologies have been replaced by computer technologies. Examples included paper maps, newspapers, postal letters, film cameras and the paper checkbook. A Machine Tool instructor described this mismatch when he said: "when I was in college, the internet wasn't around so I needed to purchase and have these resources not only for this class, but also for future classes … it seems modern students are more likely to Google questions over opening their textbook."

Conclusions

Womack and Jones (1996) state, "the objectives of lean enterprise are very simple: correctly specify value for the customer, avoiding the normal tendency for each firm along the stream to define value differently to favor its own role" (p. 276). The following conclusions have

been sorted by value and waste to provide for greater understanding on the perceptions students and faculty have with regard to textbooks.

Conclusion 1. In reference to the extent to which textbooks are adding value to the teaching and learning process from a student perspective, this study concludes:

- When properly utilized, the textbook serves as a valuable resource for working on homework or preparing for class.

- Students prefer books that are representative of the industries they are studying. These include manuals such as industry standards, handbooks and codebooks.

- Students prefer step-by-step tutorials and videos over long narratives.

- Students prefer E-books to hard copy textbooks.

Conclusion 2. In reference to the extent of waste relative to the role of the textbook from a student perspective, this study concludes:

- Some faculty require the purchase of textbooks that are seldom used.

- The college bookstore has limited purchasing options when it comes to used, rental and e-books.

- Students on financial aid are limited to the purchasing options of the Bookstore as they wait for financial aid packages to come through.

- Students are frustrated with the high cost to purchase textbooks.

Conclusion 3. In reference to the extent to which textbooks are adding value to the teaching and learning process from a faculty perspective, this study concludes:

- Textbooks are extremely valuable in the development of courses and faculty preparations to teach new topics.

- Textbooks serve as an additional perspective allowing students to see course content from different angles.

- Textbooks serve to provide instructional clout to the lectures and lessons offered by the instructor.

Conclusion 4. In reference to the extent of waste relative to the textbook role from a faculty perspective, this study concludes:

- Faculty feel obligated to make accommodations for students that do not have the required textbook during the first week of class.

- Students are "quite savvy" in their attempts to get by without buying a textbook.

- Students are more likely to skim the textbook as opposed to reading in great detail.

Recommendations

As a private non-profit institution that has been in continuous operation for more than 100 years, Dunwoody has trained more than 200,000 men and women for the workforce. Like most private schools, Dunwoody struggles to compete with state colleges which have significantly lower tuition. The ability to deliver a different value-proposition than its competitors by providing an array of hands-on technical programs that range from certificates to baccalaureate degrees gives Dunwoody a unique advantage. Based on the findings of this study, the following recommendations are presented:

Recommendation 1. Regarding the current textbook model, these research findings suggest that administrators and instructors, with student input, should research and collaborate on the development of an all-inclusive model of tuition. Such a model would require students to pay more in tuition up front, thereby ensuring that everything they need, (including books), would be there on the first day of class. This model would provide less stress for both students and faculty

as schedules won't need to be adjusted and students could start working right away. Additionally, the elimination of structured and unstructured fees ensures that each student pays the same price for college and is not limited by differences in financial aid packages.

Recommendation 2. Beyond cost, underutilization was the second largest concern for the student focus groups. The influence of textbook cost and utilization has a direct impact on the quality of life for college students (Martin et al., 2017). The research findings suggest a need for faculty training to ensure textbooks are being utilized at the appropriate level. Feedback from students could be discussed at all-faculty development sessions to ensure faculty understand the negative connotations associated with underutilization. In addition to listing assignments on the syllabus, administration could also consider requiring textbook references associated with each lesson to be listed as well.

Recommendation 3. Dunwoody faculty and students agree that the current process for school-issued laptops represents an excellent model for improvements to textbooks. The research findings recommend utilizing an electronic library of textbooks that could be stored on the cloud. Students already bring their laptop to class each day. This single device could eliminate the need to purchase books, lug heavy books from class to class or worry about return dates. One faculty member mentioned "I've never had an issue with students not having a computer … Why? … because it's provided and built into the tuition model."

Future Research

Based on the findings of this study, the following opportunities for future research are suggested. The first area to look at includes electronic resources and accessibility. This study found that Dunwoody students enjoyed the current laptop lease model in regards to hardware and software. Dunwoody students also stated a desire to gain greater access to e-books and cloud-based learning resources. Students are quite savvy using laptops, tablets and smartphone

applications. Continued research on the accessibility and use of electronic resources, cloud-based references and different hardware platforms will be of great benefit. E-books offered on these different devices should continue to be compared to each other and to traditional paper resources for effectiveness.

The next area of research to consider is that of simplifying the tuition and fees model. Students and faculty alike described how financial aid and textbook availability in the bookstore can limit purchasing options for students. Several industries have benefited from all-inclusive pricing. Continued research on the all-inclusive tuition model is needed to determine its ability to help control costs and simplify the pricing model. The current model requires students to purchase many of their learning resources on their own resulting in varied purchasing options and large disparities in cost. Future research should include measuring how rolling all expenses and fees into a single per-credit cost could save both the college and students money while providing a better college experience. Benchmarking these practices with similar institutions could prove to be valuable.

Faculty and students differ greatly on the value and expectations associated with the current textbook model (Jones, 2011). This study showed that Dunwoody students and faculty utilize this important resource in different ways. Future research is needed to expand this study beyond Dunwoody College of Technology. Additional focus groups at different institutions will add to the breadth of understanding on how the college textbook adds value to the learning process. At the end of the day it's about understanding how to better utilize limited resources to make for a better learning environment.

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Appendix A: Focus Group Interviews – Opening Script

Introduction: Hello everyone, thank you for coming. My name is E.J. Daigle and I am a graduate student at the University of Wisconsin – Stout. I am researching the perceptions of the college textbook model with students and faculty in the manufacturing programs here at Dunwoody College of Technology. This study is being conducted using two student focus groups and one faculty group. This session will be recorded for research purposes only.
Consent: *Start recording device.* Today's date is XX/XX/XX and the following student (or faculty) focus group is being conducted with X participants. Each of you have signed a consent to participate in the study. I would like to remind each of you that your decision to participate or not will not affect current or future relations with the college. You can feel free to withdraw at any time if you so choose.
Current Textbook Model: The current textbook model at Dunwoody College of Technology is for instructors to adopt textbooks that serve as an additional resource for learning beyond lectures and labs. Instructors submit book orders through the Dunwoody Bookstore and the bookstore will stock books at the beginning of each term. Students will receive a course syllabus that calls out all required learner supplies, including textbooks. Students are then expected to obtain the necessary textbooks during the first week of class. Students can purchase in the college bookstore or by any other means they choose.
Value and Waste: For the purpose of this study, a lean manufacturing lens is being applied to the questions on textbook perceptions. In front of each of you is the definition of value and waste used in this study. Please refer back to this when you are thinking about your responses.   *Value -* For the purpose of this study, value was measured by considering student and faculty perceptions of textbook importance, benefit and usefulness.   *Waste -* For the purpose of this study, examples of waste include but are not limited to; irrelevance, underutilization, poor return on investment (ROI) or a source of confusion.
Logistics: This interview will last approximately 90 minutes during which time all conversations will be recorded on this audio recording device. The audio recording is only being used for research and will be destroyed upon completion of the study. No names or other identifying data will be shared as a result of this interview.
Moderation: The goal of focus group research is to encourage conversation and uncover honest perceptions. Everyone in this room is an expert and everyone should be allowed an equal opportunity to speak. There are no right or wrong answers, only differing points of view. I encourage you to address each other as well. This can only add to the conversation going forward. I will at times moderate by asking individual follow-up questions.
Final Directions: I politely ask each of you to place cell phones in silent for the duration of the interview. Prior to starting the discussion, does anyone have any questions?   *If not, let's begin with question 1.*

Appendix B: Focus Group Questions

	Faculty Questions	Student Questions
	Opening	**Opening**
I	Please tell us about yourself; name, program area and how long you have been teaching.	Please tell us about yourself; name, program of study and class level (freshman, sophomore, etc.).
	Introductory Question	**Introductory Question**
1	How do you currently research and adopt the textbooks needed for your coursework?	How do you currently obtain/purchase the textbooks needed for your coursework?
	Transition Question	**Transition Question**
2	How do you feel about the current textbook model?	How do you feel about the current textbook model?
	Key Questions	**Key Questions**
3	Why are textbooks important to the delivery of your courses?	Why are textbooks important to the successful completion of your coursework?
4	What aspects of the textbook model do you find important or beneficial?	What aspects of the textbook model do you find important or beneficial?
5	Describe a time when the textbook was either not utilized or did not add value to the coursework.	Describe a time when the textbook was either not utilized or did not add value to the coursework.
6	How would you describe the cost of textbooks from a return on investment perspective?	How would you describe the cost of textbooks from a return on investment perspective?
	Ending Question	**Ending Question**
7	If you could recommend improvements to the current model for textbooks, what would they be?	If you could recommend improvements to the current model for textbooks, what would they be?

Probing Questions

Why do you think this is the case?
Would you explain further?
Please give an example.

Appendix C: Institutional Review Board Approval

Office of Research and Sponsored Programs
152 Vocational Rehabilitation

UNIVERSITY OF WISCONSIN
STOUT
WISCONSIN'S POLYTECHNIC UNIVERSITY

University of Wisconsin-Stout
P.O. Box 790
Menomonie, WI 54751-0790

Phone: 715-232-1126

April 30, 2018

Everette Daigle
Career and Technical Education
University of Wisconsin-Stout

RE: **Student and Faculty Perceptions of Textbook Value in the Manufacturing Programs at Dunwoody College of Technology**

Dear Everette,

The IRB has determined your project, *"Student and Faculty Perceptions of Textbook Value in the Manufacturing Programs at Dunwoody College of Technology"*, is **Exempt** from review by the Institutional Review Board for the Protection of Human Subjects. The project is exempt under **Category # 2** of the Federal Exempt Guidelines. Your project is exempt for 5 years from **April 30, 2018**. If a renewal is needed, it is to be submitted at least 10 working days prior to the approvals end date. Should you need to make modifications to your protocol, please complete the modification form.

Informed Consent: All UW-Stout faculty, staff, and students conducting human subjects' research under an approved "exempt" category are still ethically bound to follow the basic ethical principles of the Belmont Report: 1) respect for persons; 2) beneficence; and 3) justice. These three principles are best reflected in the practice of obtaining informed consent from participants.

If you are doing any research in which you are paying human subjects to participate, a specific payment procedure must be followed. Instructions and form for the payment procedure can be found at http://www.uwstout.edu/rs/paymentofhumanresearchsubjects.cfm

If you have questions, please contact the IRB office at 715-232-1126, or buchanane@uwstout.edu, and your question will be directed to the appropriate person. I wish you well in completing your study.

Sincerely,

Elizabeth Buchanan
Interim Director, Office of Research and Sponsored Programs; Human Subjects Protections Administrator, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research

CC: Carol Mooney

Appendix D: Participant Invitation

Dear [Name of Participant],

My name is E.J. Daigle and I'm currently finishing my Doctor of Education Degree at the University of Wisconsin Stout. Over the coming weeks I will be conducting research on faculty and student perceptions of textbook value in the manufacturing programs at Dunwoody College of Technology. My goal is to conduct two focus groups before the end of spring semester of 2018 and publish my findings over the summer. The results of this research will be utilized to investigate new processes for textbook selection, acquisition and utilization. Your name was selected at random from a list of potential Manufacturing Department students. I would like to invite you to be part of one of these focus groups. In appreciation for your participation, refreshments will be served and each participant will receive a $25 Barnes and Noble gift card. This invite is going out to 24 total students, but each focus group will be limited to the first 10 students to respond.

Please RSVP for one of the sessions by visiting the link below

https://www.eventbrite.com/e/textbook-research-focus-group-tickets-45706575598

Thank you for your time,
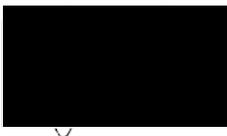
E.J. Daigle

Dean – Robotics & Manufacturing

Appendix E: Participant Consent Forms

Research Involving Human Subjects

Consent to Participate In UW-Stout Approved Research

Title: *Student and Faculty Perceptions of Textbook Value in the Manufacturing Programs at Dunwoody College of Technology*

Investigator: **Research Advisor:**

Everette J Daigle   *Dr. Carol Mooney*
818 Dunwoody Blvd   *University of Wisconsin - Stout*
Minneapolis, MN 55403   *CommTech Bldg, Menomonie, WI*
612-381-8172   *715-559-1998*
daiglee7002@uwstout.edu   *mooneyc@uwstout.edu*

Description:
You are invited to participate in the following research study, "Faculty and Student Perceptions of Textbook Value in the Manufacturing Programs at Dunwoody College." You were selected as a possible focus group participant based upon your enrollment status, program of study and experience using textbooks in CTE coursework. Students participating in focus groups will be asked to describe both positive and negative experiences they have had with textbooks during their studies at Dunwoody College. These sessions will be audio-recorded and transcribed to look for patterns between participants. This data will be used to make recommendations on potential process improvements that could be made to the current textbook process.

Risks and Benefits:
The only potential risk is that some participants may feel uncomfortable discussing textbook concerns that are unique to them. Examples include students that may struggle to afford books or potentially have not done well in classes because they underutilized the text or could not afford it. The major benefit of this study is the opportunity to collect data that finds patterns of value and waste that could be addressed in a new textbook model.

Time Commitment and Payment:
Each participant will be asked to participate in a single focus group interview lasting approximately 90 minutes. Upon completion of this session each participant will receive a $25 bookstore gift card.

Confidentiality:
Your name will not be included on any documents. Audio files will be used to create written transcripts that will not identify students by name. Upon completion of the data analysis, all audio files will be destroyed. We do not believe that you can be identified from any of this information. This informed consent will not be kept with any of the other documents completed with this project.

Right to Withdraw:
Your participation in this study is entirely voluntary. You may choose not to participate without any adverse consequences to you. Should you choose to participate and later wish to withdraw from the study, you may discontinue your participation at this time without incurring adverse consequences."

IRB Approval:
This study has been reviewed and approved by The University of Wisconsin-Stout's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have questions or concerns regarding this study please contact the Investigator or Advisor. If you have any questions, concerns, or reports regarding your rights as a research subject, please contact the IRB Administrator.

Investigator: **IRB Administrator**
Everette J Daigle   *Elizabeth Buchanan*
818 Dunwoody Blvd   *Office of Research and Sponsored Programs*
Minneapolis, MN 55403   *152 Vocational Rehabilitation Bldg*
612-381-8172   *UW-Stout, Menomonie, WI*
daiglee7002@uwstout.edu   *715-232-2477*
                                                           buchanane@uwstout.edu

Research Advisor:
Dr. Carol Mooney
University of Wisconsin – Stout
CommTech Bldg, Menomonie, WI
715-559-1998
mooneyc@uwstout.edu

Statement of Consent:
By signing this consent form you agree to participate in the project entitled,
Student and Faculty Perceptions of Textbook Value in the Manufacturing Programs at Dunwoody College of Technology

_____
        Name (printed)   Name (signed)   Date