

# DETA Research Toolkit

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By:

The National Research Center for Distance Education and Technological  
Advancements (DETA)

University of Wisconsin-Milwaukee

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# Welcome Letter



*The welcome letter is intended to provide you an introduction to the grant goals and research efforts.*

Welcome to the DETA Research Toolkit for cross-institutional research on distance education!

The University of Wisconsin-Milwaukee established the National Research Center for Distance Education and Technological Advancements (DETA) to conduct cross-institutional data collection with 2-year and 4-year Institutions of Higher Education (IHEs) with the goal of fostering student access and success through evidence-based online learning practices and technologies. Specifically, the Center will identify and evaluate effective course and institutional practices in online learning (including competency-based education) for underrepresented students. The three primary goals are to: 1) understand and determine distance education outcomes; 2) identify practices (instructional and institutional) that impact those outcomes; and 3) conduct rigorous, interdisciplinary, and standardized research to identify outcomes and influences for all students, including those with disabilities.

With the carefully-established research model for distance education developed through a year-long process including a national summit of experts in the field, the next goal for DETA is to collect data at the course, program, and institutional levels to help DETA and other partners identify key factors at multiple levels for the purpose of informing future instructional practices. DETA developed research toolkits for the national DETA community to use, including evidence-based and exploratory operationalizations and definitions evolved from a multidisciplinary effort. These toolkits include several approaches including experimental and survey instrumentation collaboratively developed by DETA staff, DETA research fellows, UWM partners [Panther Academic Support Services (PASS) and Rehabilitation Research Design & Disability Center (R2D2)], institutional partners [Milwaukee Area Technical College (MATC), University of Wisconsin System Administration (UWSA), and University of Wisconsin-Extension(UW-E)], and national experts to ensure the methodology for data collection is flexible and properly adapted to best reach populations of interest.

DETA looks to engage other interested institutions for sample study sites and/or conducting research using the new research toolkits through a DETA grant process for cross-institutional research. The call for proposals is included in this toolkit and outlines the requirements for

submission. Criteria were developed for proposal review and selection of the most suitable research efforts. Awardees will be heterogeneous, including courses and programs from 2-year and 4-year institutions. Individuals, programs, institutions, and multi-institution collaborators are invited to submit proposals. Proposals are due no later than November 1st, 2015. Announcements of award recipients will be made December 1st, 2015. Data must be gathered and submitted to the DETA team no later than June 1st, 2016. DETA will conduct cross-institutional analyses to address the top research questions identified and then develop effective use cases sharing effective instructional and institutional practices that impact the desired outcomes in the final year of the grant.

If you have any questions, please don't hesitate to contact us at [deta-staff@uwm.edu](mailto:deta-staff@uwm.edu) or on Twitter at @UWMDETA.

Warmest regards,

DETA

*Note: The data grant proposal and summary are available at: <http://uwm.edu/deta/grant-summary/>.*

# Toolkit Overview



*The overview provides you a brief glimpse as to the purpose and contents of the toolkits.*

The toolkit presented in represented this document is meant to function as a living document. The DETA Research Center will continually be seeking feedback and gathering evidence through research practice to improve the quality of the toolkit in the future. As you can see, versioning of the document is available as illustrated on the cover sheet.

The primary goal of the toolkit is to facilitate cross-institutional research as part of the U.S Department of Education, Fund for the Improvement of Postsecondary Education (FIPSE) award received that resulted in the creation of the DETA Research Center in 2014. A secondary goal is to serve as a catalyst for research across the country by providing access to research through the dissemination of this toolkit, in particular the study guides and instrumentation within it.

Within this toolkit you will find the following materials to assist in the research of distance education.



## Grant Awards

The first section details the request for proposals, including grant requirements and proposal requirements.

## Research Model

The second section details the year one development of a research model for online learning. These efforts include the DETA national summit of 2015 and the development of the desired outcomes, top research questions, and the framework of inquiry.

## Guides to Research

The third section details experimental and survey research designs, including the mining of student information system data to complement either design.

## Data Collection

The fourth section describes process development and instrumentation for data collection.

## Data Codebooks

The fifth section includes codebooks defining variables, identifying measures and associated coding.

## Supplemental Materials

The sixth section includes supplemental materials and summaries need for conducting research.

## Appendices

The final section includes appendices referenced in the toolkit.

# Grant Awards



# Request for Proposals



*Under the U.S. Department of Education, Fund for the Improvement of Postsecondary Education, the DETA Research Center received a grant award and allocated funds for sub-grant awards to conduct cross-institutional research. A competitive review of proposals will determine distribution of these funds.*

**Due: November 1st, 2015**

**Contact: [deta-staff@uwm.edu](mailto:deta-staff@uwm.edu)**

## Background

The University of Wisconsin-Milwaukee (UWM) established the National Distance Education and Technological Advancements (DETA) Research Center to conduct cross-institutional data collection with 2-year and 4-year Institutions of Higher Education (IHEs) funded by the U.S. Department of Education's Fund for the Improvement of Postsecondary Education (FIPSE).

The objective of the DETA Research Center is to promote student access and success through evidence-based online learning practices and learning technologies. Specifically, DETA will identify and evaluate effective course and institutional practices in online learning (including competency-based education) for underrepresented individuals (i.e., minorities, first generation, and students with disabilities) through rigorous research.

For additional information on DETA efforts, please review *Research to Ensure Access and Success in Higher Education* by Tanya Joosten in the EDUCAUSE Review retrievable from:

<http://www.educause.edu/ero/article/research-ensure-access-and-success-higher-education>.

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DETA has allocated grant funding for disbursement of DETA grant awards to support research at study sites across the United States. Study sites can include course-level and institutional-level 2-year and 4-year IHEs. This is a competitive grant award process. There is a competitive preference for competency-based education programs. Response to this call for proposals will result in stipends ranging from \$5,000 to \$20,000. Monetary amounts will be determined based upon 1.) the degree to which the proposal fulfills the grant requirements, and 2) the level of need to conduct the proposed research. Importantly, the award will be paid



once proposal deliverables are submitted and, therefore, cannot be used to provide student incentives.

### DETA Toolkits

Research conducted by the DETA grant awards recipients must utilize the DETA Research Toolkits available at: <http://uwm.edu/deta/toolkit>. These toolkits include:

- Top research questions driving DETA research
- A Framework of Inquiry (FOI) including variables and measures for the associated research questions
- Instrumentation and guides for data collection, including:
  - Survey research - survey instruments and research guides.
  - Data mining research - student information system measures, coding, and data mining techniques.
  - Experimental research - research guide for experiments, including potential interventions and assessment protocols.
  - Excel forms for data submission to DETA for cross-institutional research.
- Sample IRB forms and language to assist in IRB approval of research
- Timetable for research

### DETA Grant Requirements

Those selected for DETA grant awards must complete the following grant requirements to receive their award:

1. Identify key research question/s from the DETA research toolkit, from which the investigator must develop specific research questions and hypotheses to guide their research.
2. Obtain and provide the DETA Research Center with evidence of Institutional Review Board (IRB) approval from your institution or submit needed information to receive IRB



approval through a deferral agreement with the University of Wisconsin-Milwaukee's IRB as provided by DETA's IRB approved study.

3. Utilize and provide evidence of utilization of research toolkits to conduct data collection through student information system data mining, survey administration, and/or experimentally designed studies.
4. Submit data sharing agreement and data in required formats to the DETA Research Center for cross-institutional analysis.
5. Participate in a national meeting with other DETA grant awardees at the EDUCAUSE Learning Initiative (ELI) annual meeting in 2016 and 2017. Funding for travel will not be provided, so please include conference registration (member rate) and travel expenses in your award budget or determine alternative funding.
6. Submit responses to the DETA grant awardee survey for grant evaluation.
7. Meet milestones as indicated by the DETA Research Center.
8. Provide a point of contact for communications. Be willing to meet virtually each month with the DETA Research Center and provide updates about the progress of the study.
9. Meet dissemination requirements, including written results (APA format) and a presentable form of the results, including graphic representations of the results (bar charts, graphs). Samples will be provided.
10. Include justification for stipend and plan for funding allocation. Technology hardware and software and student incentives will not be funded. Stipends for faculty and staff and funding for dissemination at ELI or other venues are permitted.

Note: Interested individuals and institutions must submit a proposal that adheres to the following requirements. Proposals that do not adhere to the requirements will not be reviewed.



## Proposal Requirements

Format: Single-spaced, 12 point font, no longer than 5 pages

### **Abstract (150-300 words)**

Detail the objective and significance of the proposed research project. Additionally, please provide a brief explanation of your proposed methodological process and the research question/s you will be addressing.

### **Rationale and Purpose (approximately 2 pages)**

What is the profile of your institution? Please provide a description of your blended and/or online programming, competency-based programming (if available), and your student body (including percent minorities, first generation, and students with disabilities).

Please include an explanation of how your proposed research aligns with the Center's [research goals](#).

### **Research Plan (approximately 2 pages)**

What research question will you be addressing? See <http://uwm.edu/deta/top-research-questions/> for a list of potential research questions. What additional research questions or hypotheses related to your primary research questions will you be addressing?

What variables will be examined? How will the variables be measured? See the Framework of Inquiry developed by the DETA Research Center efforts at: <http://uwm.edu/deta/framework-of-inquiry/>.

While considering alignment with the Center's [research questions](#), determine study-specific research questions and hypotheses and illustrate the intended contribution to the literature and practice.

More specifically, using previous research and your own instincts, please consider the relationship you are predicting or exploring among the variables included in the Framework of Inquiry. Provide an explanation of the variables to be studied within the overarching research question you intend to address, how those variables are theoretically related, and the



specific hypotheses or research questions to be tested/answered. Please briefly describe what you expect to find.

What is your sample? How was/will this be determined?

How will the data be collected? Who will collect the data? Describe the study participants and sample.

How will the data be analyzed? Who will analyze the data? Describe the project personnel.

Please describe the participants in the study, specifically population of interest/sample, levels of analysis (student, instructor, course, program, institutional), proposed method/s of data collection, and proposed statistical techniques. Be specific as to how you will collect and analyze the data.

Include whether your approach includes data mining, experimental research, and/or survey research. As you know, methodological support and alignment are desired. Experimental design principles, survey instruments, and data mining techniques are included in the research toolkits.

What is the timeline for the research? Keep in mind that research must be completed no later than June 1, 2016.

What additional tools and/or support may be needed to complete the research?

What additional questions do you have for the DETA team regarding the grant award or efforts you will undertake?

### **Competitive preference**

There is separate funding and a competitive preference for research pertaining to competency-based educational programming. If your research proposal is an examination of competency-based education, please review the request for proposal specific to the competency-based funding coming available late October. To receive an announcement of the availability of this proposal please complete the “join our community” form on the home page at <http://uwm.edu/deta>.



## Proposal Review Criteria

- A. Rationale for the proposed research design aligns with the DETA Research Center's Goals.
- B. Participants in the study include populations of interest (students with disabilities, first generation, and minorities).
- C. Research plan, including question/s, variables, measures, sample, data collection methods, and proposed data analysis techniques are aligned.
- D. The proposal indicates the ability of personnel to gather and analyze the data.
- E. Proposal timeline is feasible and realistic.

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Please submit your proposal using this form:

**<http://tinyurl.com/nzjoxmv>**

*Note: Proposals should be submitted no later than November 1st, 2015, 11:59PM CST. Late submissions will automatically be omitted from the competition. Awards will be announced no later than December 1st, 2015.*



# Research Model



## Research Model Overview



*An overview of the research model development, including justification, over year one of the grant*

### Background

In developing the grant proposal for the U.S. Department of Education's Fund for Improvement in Postsecondary Education (FIPSE), several researchers from the University of Wisconsin-Milwaukee (UWM) spent a Friday afternoon discussing the types of research projects we would propose to be conducted by the new National Research Center for Distance Education and Technological Advancements (DETA). What became clear in that meeting room was evidence of a broader issue in distance education research. Individuals who are studying distance education, including eLearning, blended learning, and online learning, are heterogeneous. These individuals represent an array of disciplines, including different paradigmatic, theoretical, and methodological approaches to studying distance education, just as we were witnessing in the room that day. The opportunity of this diversity in research approaches has the potential to provide our higher education communities a greater understanding of the complexity of human interaction in distance education. The opportunity identified also presented a new problem to solve - we don't all speak the same language about research in distance education. Evident from this discussion was a need for coherency about how to approach the study of this phenomenon.

In distance education, a common language or ground has not yet been established. Although existing scholarship attempts to establish an identity for teaching and learning on the fringe or margins (see Moore, 2013), such as distance education, there is still much work to be done. It is common in other disciplines to struggle with finding this common ground as well (e.g., Corman and Poole, 2000). Yet, unlike many other disciplines that have models illustrative of the phenomenon of interest or research models that guide the design of research, distance education has seen little traction in this area. A cohesive approach to researching distance education from a transdisciplinary lens is pertinent.

The lack of common language and work being conducted in disciplinary silos has led to a disregard or lack of acknowledgement of previous developments in the field. Furthermore,



the frequent disconnect between the fast moving development of practice and redundant research of already proven practices is less than helpful to developing distance education. Several authors over the last several years have noted this dilemma. Saba (2013) discusses that “authors, editors, and reviewers are not familiar with the historical origin and conceptual growth of the field of distance education...history starts from when they become interested in the field” (p. 50). Dziuban and Picciano (2015) refer to Roberts (2007) and Diamond (1999) in describing this as a type of amnesia where “we tend to trust what we have seen for ourselves and dismiss events that have occurred in the distant past...we forget anything but what we are experiencing at the moment and assume that the present is a way it has always been” (p. 179). Moore and Kiersey (2011) have discussed this tendency as a threat to good practice and good scholarship.

Our initial goal, as outlined in the grant, is to solve this problem and create a language that will have sustainability across disciplines and temporal barriers. At least in the first year, it was apparent that there was a need for grant efforts to focus on creating a language we can all understand. Also evident was the need to engage distance education stakeholders from across the country in the attempt to create an interdisciplinary lens for examining distance education. In so doing, the aim is to facilitate research efforts regarding cross-institutional distance education research as a strategy for ensuring quality in teaching and learning for all students. The research fellows on the grant team felt a desire to identify a model or models that represented research in distance education, in particular, with regard to the research that would be conducted as part of the grant activities. Moreover, the development of a framework of inquiry that included detailed representations illustrating the varying levels of inquiry as characterized by input-throughput-output processes was pertinent and useful in facilitating an interdisciplinary approach to studying distance education.

Goal 1: Develop National Distance Education and Technology Advancements (DETA) Research Models for Online Learning



### Development

The first goal of the grant activities is to develop research models for online learning that provide guidance in the practice of distance education research. The models were intended to facilitate the exploration of instructional practices, inform future instructional practices, serve as a model for future research practices across educational institutions, and enhance consistency in the field. In the development process, it became clear that a more general research model was needed to represent the various research designs that would be deployed as part of the DETA research efforts rather than several specific research models. The development of this model included the following steps:

1. Review of the literature on desired outcomes in distance education, including blended and online research, to determine key desired outcomes in practice and research in the field.
2. Identify and engage with national experts, including researchers and practitioners in the field, to identify pertinent research questions and variables of interest for enhancing the understanding of the desired outcomes.
3. Review germane research and current national efforts to ensure alignment with the development of the research model and the framework of inquiry, including identifying any gaps and future areas of research needed.
4. Create research designs, including formulating measures, instrumentation, and coding to conduct cross-institutional research within the framework of inquiry.
5. Develop a research model for online learning appropriate for interdisciplinary research and diverse methodologies to be brought to fruition in the development and use of research toolkits by researchers and practitioners across the country.

Each of these will be discussed in more detail.



## Desired Outcomes



*The grant efforts included identifying the desired outcomes or the outcomes that the research would influence.*

Prior to the DETA national summit, held at the 2015 EDUCAUSE Learning Initiative (ELI) annual meeting in Anaheim, CA, the DETA Research Center reviewed pertinent literature and documents in developing the desired outcomes (see <http://uwm.edu/deta/desired-outcomes/>). These desired outcomes were published on the DETA community site and feedback was solicited from the national experts who participated in the summit. The desired outcomes included access, learning effectiveness, satisfaction, and instructional effectiveness.

### Access

All learners who wish to learn online can access learning in a wide array of programs and courses,<sup>1</sup> particularly underrepresented learners, such as, those with disabilities, who are first generation, and minorities.<sup>2</sup> An essential component in distance education is a comprehensive infrastructure for learning that provides all individuals with the resources they need when and where they are needed. The underlying principle is that the infrastructure includes people, instructional resources, processes, learning resources, policies, broadband, hardware, and software. It brings state-of-the art technology into learning to enable, motivate, and inspire all students, regardless of background, languages, or disabilities, to achieve.<sup>4</sup>

Data can be collected by examining administrative and technical infrastructure, which provides access to all prospective and enrolled learners. Access quality metrics are used for information dissemination, learning resource delivery, and tutoring services.<sup>1</sup> Other possibilities include data gathered from student information systems, from student perception surveys, or objective accessibility ratings of online courses and programs.

### Learning Effectiveness

Learning effectiveness indicates a demonstration that learning outcomes were met or exceeded standards.<sup>1</sup> This includes areas of study with research outcomes focusing on student success in achieving learning outcomes<sup>2</sup> and other potential indicators of achievement (success, failure,



achievement gains, academic achievement, improvement).<sup>3</sup> Moreover, learning effectiveness could also include topics of retention (of content).

Typically data are gathered through direct assessment of student learning (e.g. overall grades, exam grades, or other assessments), faculty perception surveys, faculty interviews comparing learning effectiveness in delivery modes, and student focus groups or interviews measuring learning gains.<sup>1</sup> Additionally, requests for new and better ways to measure what matters include concurrent data collection. Here, focusing on diagnosing strengths and weakness during the course of learning provides the opportunity for more immediate improved student performance. Furthermore, these technology-based assessments provide the opportunity to allow data to drive decisions on the basis of what is best for each and every student based on their unique attributes and interactivity in class.<sup>4</sup> Other possibilities include data gathered from student information systems or from student perception surveys.

### Satisfaction

Faculty are pleased with teaching online, citing appreciation and happiness. Students are pleased with their experiences in learning online, including interaction with instructors and peers, learning outcomes that match expectations, services, and orientation.<sup>1</sup> Satisfaction can also be indicated by retention in a course (sometimes called attrition) or program (degree completion).

Faculty and student surveys can indicate equal or growing satisfaction to traditional forms of learning. Other metrics can include repeat teaching of online courses by individual faculty and increase in percentage of faculty teaching online, showing growing endorsement. Qualitative methods can include interviews, focus groups, testimonials with faculty, staff (including advisors and tutors), and/or students.<sup>1</sup>

### Instructional Effectiveness

Instructional effectiveness indicates the quality of education meets program, institutional, and national standards.<sup>1</sup> The focus is on what and how we teach to match what people need to know, how they learn, where and when they will learn, and who needs to learn.<sup>4</sup> The areas of study might include instructional improvement, program effectiveness, administrator effectiveness, curriculum evaluation, educational quality, outcomes of education programs,



and instructional media.<sup>3</sup> Additionally, instructional effectiveness is not limited to instruction provided inside the classroom, but extends itself to instructional support or supplemental instruction and guidance provided through institutional services or through staff and individuals outside of the classroom.

Traditionally, as in face-to-face delivered courses, student ratings of instructional effectiveness are collected. However, typically these standards in distance education and online learning are communicated in a course or program rubric (e.g., UC Chico, QM) which is administered through an objective rating of a course or program in addition to traditional methods. Recent work looks to gather this data through student perceptions of instructional effectiveness through course and program rubrics converted to student surveys. Other possibilities include objective ratings of online course and program design and instructional delivery.

### References

1. Online Learning Consortium, 5 Pillars
2. U.S. Department of Education, Application for Grants
3. What Works Clearinghouse
4. National Ed Tech Plan, U.S. Department of Education



## Research Questions



*In order to achieve grant goals and guide this national research effort, a group of national experts identified research questions.*

Participants at the DETA national summit (see <http://uwm.edu/deta/summit/>) were asked to participate in two key sets of activities related to developing and prioritizing research questions in order to create a framework of inquiry to guide current and future research by identifying key variables for research model.

The research questions and associated votes were statistically analyzed for prioritization. The top research questions were identified by highlighting those that were one standard deviation at or above the mean.

### Defined Research Questions

What are the different design components (content, interactivity, assessments) that impact student learning?

What patterns of behaviors lead to increased student learning for different populations?

What support structures are critical to providing quality access to online instruction?

### Exploratory Research Questions

What are the definitions of success from students' perspective?

How can we define and measure student success beyond traditional outcomes?

What is the currency of student learning beyond the existing credit hours?

What are the key components that promote a sustainable and an effective teaching and learning ecosystem?





These research questions and how they can guide research designs and studies will be discussed in the next section, Guides to Research.

The top research questions can also be viewed at: <http://uwm.edu/deta/top-research-questions/>.



## Framework of Inquiry



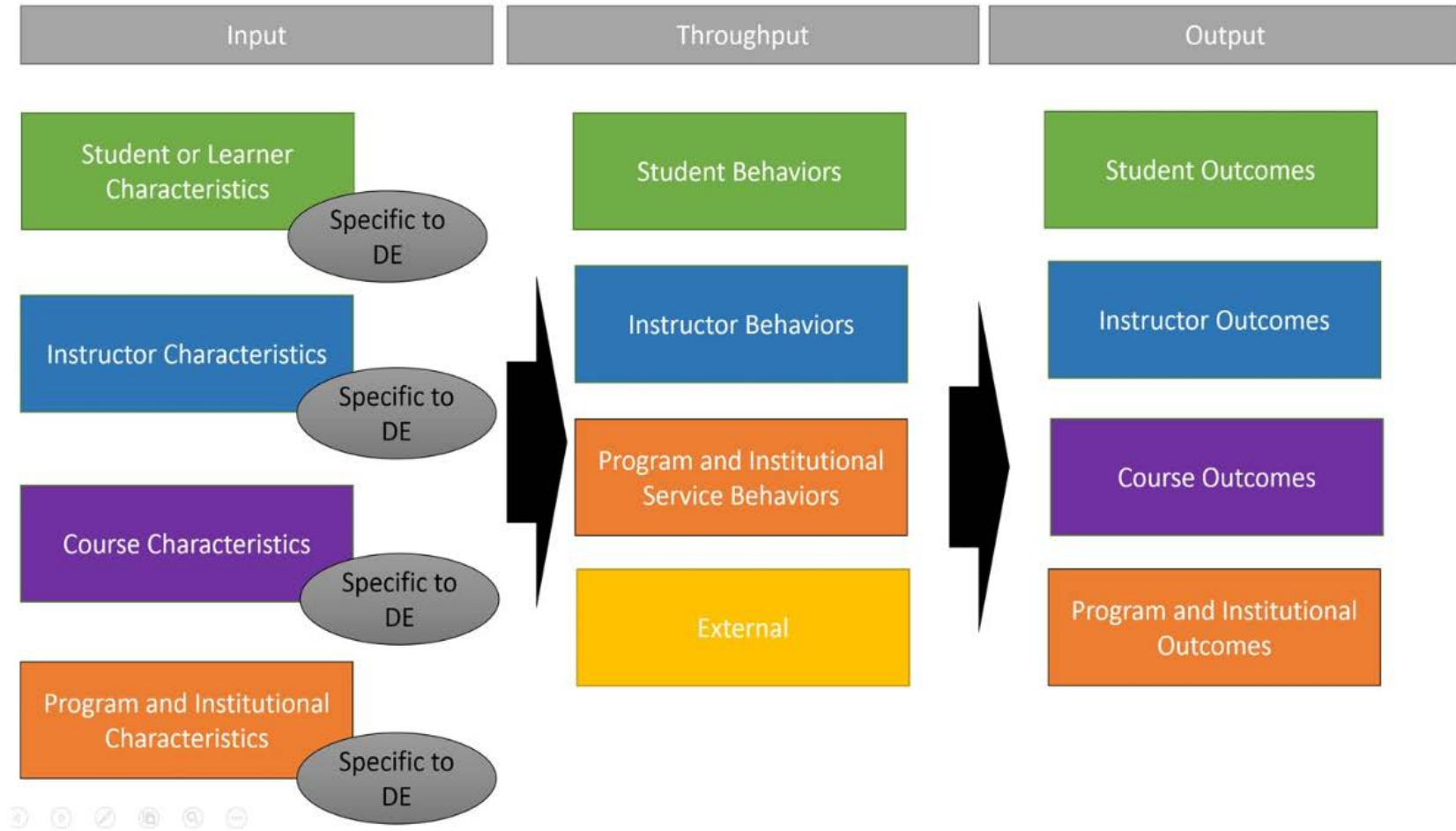
*In order to achieve grant goals and guide this national research effort, a group of national experts identified research questions.*

After the summit, the variables were examined to identify conceptual alignment with existing literature and to sort based on level of inquiry, which resulted in the framework of inquiry (see Figure 1, General Framework of Inquiry). The detailed version of the framework of inquiry, including variables, can be viewed at: <http://tinyurl.com/pluea76>.

Situated within the framework of inquiry, several research designs were created, including formulating measures, developing instrumentation, and determining coding to conduct cross-institutional research within the framework of inquiry (see Guides to Research section). These research designs included experimental and survey study designs to address the top research questions. Experimental designs included interventions identified for testing that burgeoned from discussions at the DETA national summit. Survey studies and instrumentation (applicable to both survey and experimental studies) were developed from existing research at UWM and a review of the literature, including utilized instrumentation. Survey studies included questions to gather qualitative data for analysis to address research questions of exploratory nature. Both the survey and experimental research designs are complemented by data mining of student information systems to provide learner characteristics (low-income, minority, first generation, and disabled) and outcome data (grade, completion).



Figure 1: Framework of Inquiry





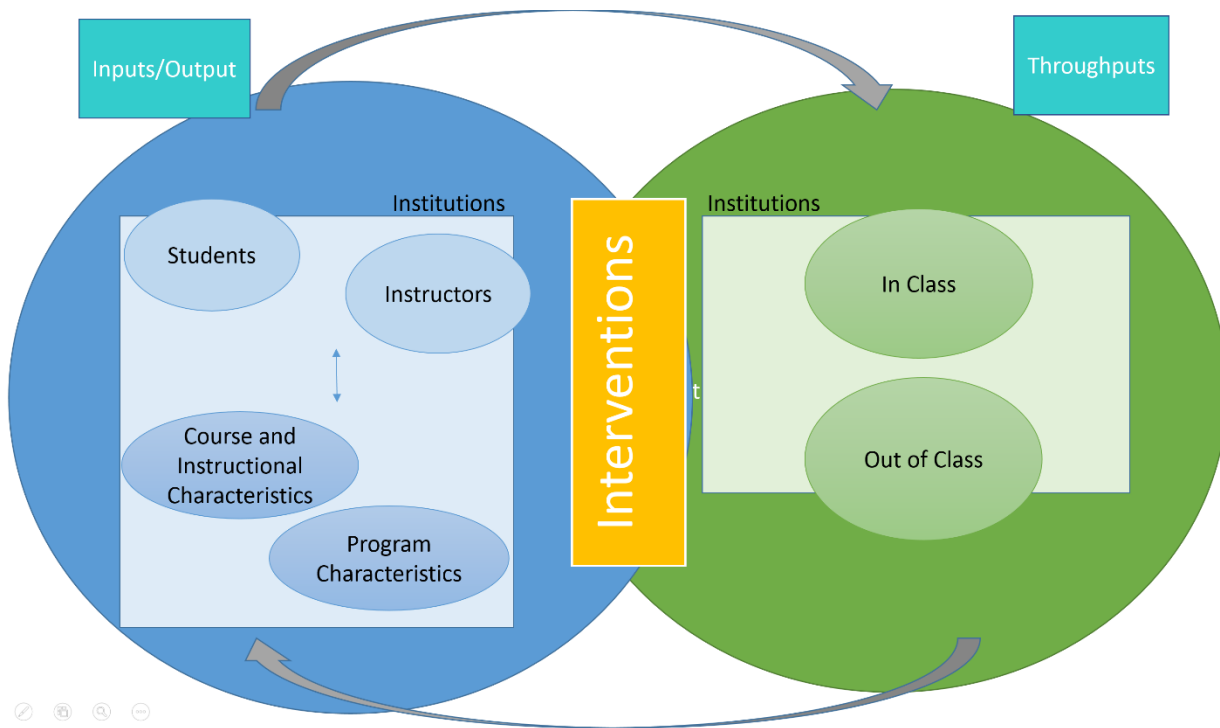
A description of the research model developed as the initial goal of the grant in year one.

# Research Model

## Model Description

Taking a structured approach to model development, a research model for online learning appropriate for interdisciplinary research and diverse methodologies was derived from a grounded and theoretical approach (see Figure, Developing Research Model of Online Learning). The model is considered grounded because it is a reflection of the research questions and framework of inquiry, including variables, and research designs developed as part of the grant activities. The model is considered theoretical since social and learning theories informed the development.

Figure: Research Model of Online Learning





There are four primary components that compose the research model for online learning. The four components include (1) inputs and outputs, (2) process, (3) context, and (4) interventions. The inputs and outputs include both agency and structural level inputs. Agency level inputs include students (learners) and instructors. Structural level inputs include the characteristics of the course, instruction, and the program that provide structure, rules, and resources to agents to facilitate the online learning process. The second component is the process, which includes in-class and out-of-class interactions that are online learning. The third component is that of the context. The context for the research of this grant is institutions of postsecondary higher education. The final component of the model is intervention. Interventions create variable conditions intended to result in a predetermined outcome, usually to increase student success.

There are three facets of the model that describe the relationship between and among the components of the model. First, the model is *cyclical* in nature in that learning is conducted in cycles with each end playing the role of input and output through an interactive process representing a continuous lifecycle of online learning. Second, the model is *transactional*. This means that online learning is a simultaneous engagement of students and instructors in the learning process. Students and instructors are linked reciprocally. Third, the model can be *structural*. Courses, instructional, and program characteristics are outcomes from human action (instructors and staff) through design, development, and modification. Also, these facilitate and constrain student interactions in online learning. Furthermore, institutional properties influence individuals in their online learning interaction through instructional and professional norms, design standards, and available resources. Likewise, the interactions in online learning will influence institutional properties through reinforcing or transforming structures.

The proposed model describes a series of inputs that can have a relationship with online learning, which is a throughput or process, inside and outside the classroom within the contexts of institutions. As mentioned earlier, for DETA research the institutional context is postsecondary institutions of higher education. The cyclical elements of the model are evident in the inputs, including the characteristics of students, instructors, course as well as instruction and programs, which may influence the online learning process, which, in return, will



influence future inputs of online learning process in a cyclical fashion. For instance, a course is designed by an instructor in such a way that it leads to increased rates of completion, which eventually can alter the program profile and potentially future course designs. Therefore, the inputs will influence the online learning process, which will in return influence the inputs through a feedback loop process. For example, students may develop new skills and become more prepared influencing achievement in future courses, instructors may learn from what works in the classroom and improve future instructional methods and course designs, and programs may have greater success. Not only is there a life cycle of online learning, but an important interplay between the success of students in a course and the continued development of courses and programs by instructors and staff within the institution.

There are individual agents in the model, including students and instructors who have characteristics and which have a relationship with online learning. First, these students and instructors are agents within the context of institutions but have influences from beyond the institution, too. The cognition and experiences (from within and outside of the institution) of students and instructors will potentially affect online learning interactions within and outside a class. Second, there are also course, instructional, and program characteristics. The design of these, in particular, will potentially enhance or hinder the process of online learning. These five inputs will have relationships with the online learning process.

Interventions can be employed at any level of these input variables in order to enhance the probability that the online learning process will be positively influenced. Interventions can be at the agent level to develop students or instructors, or at the course, instructional, or program levels to potentially improve the interactions of students and instructors to enhance online learning. At the learner level, an intervention may be a workshop about taking an online course. At the instructor level, an intervention may be a faculty development program for teaching online. At the course and instructional level, an intervention may be focused on how content is designed to meet the course learning outcomes to enhance the student-content interaction. At the program level, an intervention may be the receipt of tutoring support during the course. Interventions at the agent or structural levels are intended to increase student success by enhancing online learning.



The model represents an array of research designs, including experimental, quasi-experimental, survey, and qualitative all of which are appropriate for DETA research. Input variables, such as student or course characteristics, can be mined through institutional technology systems, such as student information systems, or can be reported on surveys. This information can be used for all research designs. Experimental or quasi-experimental studies would focus on comparisons of the control and experimental condition based on the intervention applied usually through the comparison of student assessments. Survey studies can examine the ability to predict student outcome variables based on the student self-report of instructional and program/institutional characteristics, including reports of behaviors taking place or perceptions of in-class and out-of-class. They can lead to conclusions regarding significant relationships based on inferential statistics. Finally, qualitative data can be collected through surveys and other methods to better understand or develop measurement for an array of constructs (e.g., student motivation, ecosystem components). The next section, Guides to Research, will provide greater detail.

*Have comments or questions about the Research Model? We would love to hear your feedback.*

*Feedback on the model can be submitted using this form: <http://tinyurl.com/pj5j8ar>.*

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# Guides to Research

The DETA research conducted will focus on two primary research designs, experimental and survey. In this section, guides to conducting experimental and survey research are included. These guides are provided to assist individuals in designing studies to conduct research at their postsecondary institutions, to facilitate the collection of cross-institutional data for analysis, and in developing proposals suitable for potential funding through the DETA grant awards described in the RFP section of this toolkit. Both of these guides are intended to result in data collection and analysis suitable to achieve the goal of identifying key instructional and institutional factors that influence the success of students who are minorities, who are first generation, and/or who have an impairment or disability. It is expected that each study designed would include student data collected from the institutional data sources (e.g., data warehouse, student information system). More details will be provided in the next section.

## Experimental Research Design



*A description of consideration in designing and conducting experimental research. Reference in developing a proposal in response to the call.*

### Methodological Considerations in Conducting Experiments

This toolkit on conducting experiments discusses a range of methodological considerations in conducting experiments. These methodological considerations are suggestions rather than requirements. You do not need to incorporate all of the suggestions into the experiment or quasi-experiment you propose in response to the DETA request for proposals. Some of the methodological considerations (e.g., maximizing response rates, ethical protection of learners, measuring perceptions at more than one time point) may be useful in survey studies.

Non-experimental research, including qualitative methods and quantitative methods (e.g., one group pre-test posttest design) can clarify, refine, and point to new directions for research in distance education. But, because a primary goal of the DETA Research Center is to identify and verify what works in distance education, experiments are preferred because they are the only research method that can show cause and effect relationships. For this reason, true experiments, or **randomized controlled trials (RCTs)**, are considered the gold standard methodology. RCTs are relatively uncommon in postsecondary education, particularly RCTs that randomly assign students individually rather than groups of students (classes) to



intervention and comparison conditions. Both are challenging endeavors in a college or university, but random assignment of undergraduates individually is particularly challenging because it necessitates collaborative assistance of class schedulers, registrars, and campus leaders.

Random assignment addresses the issue of self-selection accounting for the success (or failure) of a distance education intervention. Because students are randomly assigned to the intervention or comparison group(s) self-selection is eliminated as a possible explanation for findings. Eliminating self-selection is important because of the biases that could potentially be associated with students self-selecting into a particular blended or distance education intervention versus the comparison course without the intervention.

### **Interventions of Particular Interest**

Although you are free to propose an experiment or quasi-experiment examining the effectiveness of any intervention, DETA has identified interventions of particular interest for investigation:

- A. Whether any of these course design interventions in online courses influence student success:
  - 1. Accelerated
  - 2. Personalized
  - 3. Adaptive
  - 4. Gamified
  
- B. Whether the instructor's provision of learner support increases student success
  
- C. Whether the frequency (or quality) of feedback from the instructor (or peers) influences student success
  
- D. Whether the types of assessments (e.g., low-stakes, mastery/fluency demonstrations) impact student success in online courses



## **Required Variables and Measures**

Required variables for all proposed DETA research include the learner/student characteristics and outcome variables below, for which the DETA team has developed standardized definitions. Please review the appropriate data collection procedures and institutional warehoused and survey data codebooks in later sections of this toolkit for more information

### Required Learner Characteristics

Income status:

Pell grant eligible versus not Pell grant eligible

Disability/impairment status:

disabled/impaired versus not disabled/impaired

First-generation status:

first generation versus not first generation college student

Racial/ethnic minority status:

racial/ethnic minority versus not racial/ethnic minority

### Required Outcome Variables

Course grade

Course completion

These variables and their associated measures are able to be captured through the student information system and survey data collected. Please review those guides for additional information.

*Note: You are encouraged to collect data beyond these required variables.*

## **Standard Measures and Instrumentation**

Use standard measures and instrumentation, preferably those specified in the [DETA Framework of Inquiry](#). Use of standard measures and instrumentation facilitates evaluation of instructional and institutional practices in distance education with diverse student populations so effective practices can be identified and applied across disciplines and institutions.



## Intervention and Comparison Groups

In an experiment, the intervention and comparison groups should only differ in terms of the manipulated variable(s), which is likely to be the active ingredient of the intervention – one group gets the intervention and the other group does not (the control or comparison group). If the intervention and comparison groups are found to differ on a variable other than the manipulated variable(s), statistical techniques need to be used to control for the difference associated with the variable not manipulated. If not controlled statistically, preexisting differences between the groups could undermine valid interpretation of the findings. For example, even with random assignment, which eliminates self-selection into the intervention or comparison groups there still could be differences between groups in learner characteristics, such as academic preparedness. If the comparison group had a significantly greater proportion of students who were academically underprepared, you might see a difference in favor of the intervention, when in fact, this difference was due to the pre-existing difference in academic preparation. *An examination of possible pre-existing differences between groups is always needed.*

If you anticipate that certain learner characteristics could affect the results, you could equally distribute students with that learner characteristic between the intervention and comparison groups during random assignment. This is referred to as stratified random assignment.

In the example below, the researcher wanted a total sample of 100 students (50 to be randomly assigned to the intervention condition and 50 to be randomly assigned to the comparison condition). Since 40% of the student population was at-risk, even proportions of at-risk students (20 at-risk and 30 not at-risk) were randomly assigned to each condition.

Students	Intervention Condition	Comparison Condition	
Not at-risk	30	30	60
At-risk	20	20	40
<b>Total</b>	<b>50</b>	<b>50</b>	<b>100</b>



## Fidelity

Because the intervention and comparison groups should only differ in terms of the manipulated variable (i.e., the intervention), it is important to:

- ✓ **Train the instructors to carry out the conditions with fidelity**
- ✓ **Create a detailed manual to guide fidelity throughout the study**  
[This is particularly important if you have the same instructor(s) teaching both the intervention and comparison students.]
- ✓ **Develop an implementation rubric**  
[This will help you determine whether the critical differences distinguishing the intervention and comparison conditions are in place.]
- ✓ **Check fidelity throughout the study**  
[It is incumbent upon the researcher to ensure the intervention and comparison conditions don't drift and quality is maintained in both the conditions during the study.]

It is far better to detect fidelity problems during the study when corrections can be made than after the study. Approaches to checking fidelity in both the intervention and comparison groups might include:

1. observing the intervention course sites *and* the comparison course sites/classes on specified days, scoring whether the features distinguishing the intervention from the comparison conditions are in place.
2. observing the intervention course sites *and* the comparison course sites/classes on specified days, scoring whether the features that are intended to be held constant (e.g., equivalent content) across the intervention and comparison groups remain constant.
3. rating digitally recorded interviews with the instructors on questions related to fidelity in both the intervention and comparison conditions at specified points in the semester.
4. surveying students in both the intervention and comparison groups during the semester to ascertain their course experiences relevant to fidelity.
5. monitoring email correspondence between the instructors and students for fidelity in both the intervention and comparison groups.



### Detecting Intervention Effects

The final size of the sample (number of participants left after student drops/withdrawals) is critical to detecting intervention effects. The probability of detecting an effect (statistical power) is largely determined by the size of the effect you wish to detect and the size of the sample. The figures below explore the relationship between the effect size and sample size needed to achieve sufficient power (.80).

If we wish to detect a 2-point difference (4%) on a 50-item exam taken by both the intervention and comparison students and we expect a standard deviation in each course of about 2.0, then our effect size for the difference is 1.0.

	Intervention Course	Comparison Course
Mean Exam Score	36	38
Standard Deviation (SD)	2	2
Effect Size	1.0	

$$\text{Effect Size (d)} = \frac{M1 - M2}{SD}$$

*You can use the calculator provided below to determine effect size:*

	Group 1	Group 2
<b>Mean</b>	<b>36</b>	<b>38</b>
<b>Standard Deviation</b>	<b>2</b>	<b>2</b>
<b>Effect Size <math>d_{Cohen}</math></b>	<b>1</b>	
<b>Effect Size <math>Glass' \Delta</math></b>	<b>1</b>	



Source: [http://www.psychometrica.de/effect\\_size.html](http://www.psychometrica.de/effect_size.html)

Now that we know our effect size for the anticipated difference is 1.0, the calculator below will determine the sample size needed for each course (n=17 in each group) to be 80% sure of detecting an effect if it exists.

The total number of subjects required: 34 (17 in each group)

Test family	<input type="text" value="t-test"/>
Sample groups	<input type="text" value="Independent groups"/>
Number of tails	<input type="text" value="Two"/>
Effect size	<input type="text" value="1.0"/>
Significance level ( $\alpha$ )	<input type="text" value="0.05"/>
Power	<input type="text" value="0.8"/>
	<input type="button" value="Submit"/>

Source: <https://www.ai-therapy.com/psychology-statistics/sample-size-calculator>

**Q:** What happens to the sample size needed if we hold our mean difference ( $M1 - M2 = 2$ ), our significance level ( $\alpha = .05$ ), and our power (.80) constant, but change our standard deviation to 3 for each course?

**A:** *Our effect size drops to  $d=.667$  and we now require 37 participants in each course to have an 80% chance of detecting a difference in performance between the courses if one exists.*





	Group 1	Group 2
<b>Mean</b>	<b>36</b>	<b>38</b>
<b>Standard Deviation</b>	<b>3</b>	<b>3</b>
<b>Effect Size <math>d_{Cohen}</math></b>	<b>0.667</b>	
<b>Effect Size <math>Glass' \Delta</math></b>	<b>0.667</b>	

The total number of subjects required: 74 (37 in each group)

Test family

Sample groups

Number of tails

Effect size

Significance level ( $\alpha$ )

Power

Here's two that you can try:

*(answers are in very small print – change the font size to check your answer).*



**Q:** What happens to the sample size needed if we hold our mean difference ( $M1 - M2 = 2$ ), our significance level ( $\alpha = .05$ ), and our power (.80) constant, but change our standard deviation to 4 for each course? (Answer: Our effect size drops to .5 and our sample size needed per group becomes sixty-four.)

**Q:** What happens to the sample size needed if we change our mean difference to ( $M1 - M2 = 4$ ), our significance level ( $\alpha = .05$ ), and our power (.80) constant, and change our standard deviation to 4 for each course? (Answer: Our effect size rises to 1 and our sample size needed per group becomes seventeen.)

### Attrition

In determining your total sample size it is important to realistically gauge likely attrition (participant loss) from your study, because high attrition may affect the ability to detect intervention effects. Historical data from the campuses that will be involved in your study or perhaps attrition rates reported in relevant studies could be valuable in projecting attrition. Consider the historical data below showing that in three of the four semesters, the intervention course had a significantly higher drop/withdrawal rate than the comparison course. Based on this information, the researcher projected that the drop/withdrawal rate would be higher in the intervention course than in the comparison course in the planned project. The drop/withdrawal differential in Spring 2014 was the lowest ( $9.4\% - 6.5\% = 2.9\%$ ), while the largest differential was between the intervention course in Spring 2014 and the comparison course in Fall 2015 ( $9.4\% - 2.5\% = 6.9\%$ ). Thus, using the drop/withdrawal rates from the historical data, a differential loss of approximately 3% to 7% between the intervention and comparison courses was projected. Projected drop/withdrawal rates less than 10% in both the intervention and comparison courses is good news because Shadish, Cook, and Campbell (2002) indicate that when effect size is high and attrition rates are below 10% there is likely little, if any, change in study conclusions due to attrition.

Source: Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Boston: Houghton-Mifflin.



## Historical Student Drop/Withdrawal Rates Used by Researcher to Project Attrition for the Planned Study

Semester	Intervention	Comparison
Spring 2014	9.4%	6.5%
Summer 2014	4.0%	7.3%
Fall 2015	8.4%	2.5%
Spring 2015	8.8%	2.6%

If high overall attrition occurs in your study, the assistance of a statistical consultant may be necessary to determine how best to handle this problem. High overall attrition is problematic because it raises the prospect that the students who dropped or withdrew from the study/courses might differ from those who remained. The possibility that differences exist between students who dropped/withdrew and those who did not drop/withdraw needs to be examined whenever overall attrition is over 10%. In addition to overall attrition, differential attrition between the intervention and comparison groups must also be examined and, if found to be high, addressed statistically to avoid weakening the validity of conclusions.

### Including Participants who Dropped/Withdrew in Outcomes

Student drops and withdrawals should be considered failures when evaluating the effectiveness of the intervention relative to the comparison. Participant outcomes (e.g., the percentage of final grades denoting success) should be based on all students, regardless of whether they dropped or withdrew from the study.

### Maximizing Response Rates

Given that your final sample size is critical to the ability to detect intervention effects, you should incorporate procedures to maximize survey response rates. Typically, high response rates are achieved only through diligent effort. Repeated well-crafted reminders to complete study surveys are an absolute must. Attention should be paid to the visual design, content,



and writing style used in reminders and in the survey. A *personalized* request sent to each participant to help by completing the survey may be necessary. Conveying the reasons for and importance of completing the surveys may increase response rates. The response rate can also be maximized through the use of different approaches (e-mail messages, course news, telephone calls, postcards, letters, Tweets, other social media). It is important to be mindful of students' privacy since some forms of communication are public beyond the course. Modest monetary incentives may also increase response rates.

### Example Email Reminder for Entire Class

Dear Students,

This is a friendly reminder to complete Survey 3. The last day to complete the survey is **Sunday, December 22nd**. Please complete it as soon as possible -- it only takes 5 to 10 minutes!

Link for Survey 3: [INSERT LINK]

Remember, you will get extra credit for completing the survey - so don't miss out! I really appreciate your participation as it is important to the research.

### Example Email Reminder for Subgroup Who Did Not Complete Survey Yet – Use BCC

Hi Students,

You are receiving this email because you have not yet completed Survey 3 to count toward extra credit in your final grade. Please complete Survey 3 as soon as possible.

**Deadline:** Sunday, Dec. 22 by 11:59 p.m.

**Here's the link for Survey 3:** [INSERT LINK]

It is important for our research and understanding of student learning.



### Example Email Reminder for Individual Students

Hi Douglas,

I have a favor to ask. Could you take the third survey that is part of the study in your course? It would only take 5 to 10 minutes of your time, depending on how fast you complete it. You would help me, contribute to our understanding of X, and get extra credit toward your course grade. Here's the link:

5 to 10 minutes of your time gets you the extra credit, and I would be so appreciative!

Only group responses are being looked at. No one will know your responses. You only gain and can't lose anything by completing the survey. Could you please help me by taking the survey **by 11:59pm on Sunday, Dec. 22?**

Thank you!

### Ethical Protection of Learners

All research projects awarded DETA funding must secure Institutional Review Board (IRB) approval. This is a requirement, regardless of whether your study involves participants or not, because the DETA grant awards are made through our federally funded grant. It is always good to make sure ethical protections are in place, and the longer term goal for all DETA funded projects is for you to disseminate the knowledge gained from your project. If you publish your study outcomes, according to national standards you are supposed to have obtained IRB approval. If your institution does not have an IRB, we will facilitate preparation and submission of the required materials to UWM's IRB. An example informed consent document is included in the section, Supplemental Materials.

Incorporating tailored versions of the following points, if applicable, into your IRB protocol and informed consent document, will assist you in obtaining IRB approval in a timely fashion. Clearly explain that students will be able to:

- decline to participate in the research and still enroll in the course(s).



- drop or withdraw from the course(s) in accordance with university drop/withdrawal deadlines and policies on tuition, without forfeiting any incentive offered. [The goal is to reduce/eliminate fear about losing incentives that may deter learners from dropping either the comparison or intervention course when it may be in their best interest to do so.]
- withdraw from the research at any time without penalty (students may remain in the course even if they are no longer a study participant).
- expect their information will be treated confidentially. [Unique codes rather than student names or other identifying information will be used to link students' survey responses, final course grades, and other outcome measures.]
- earn equivalent course credit (if extra credit is offered as an incentive for participation in your research) through an alternative option. [Offering an alternative way to earn course credit addresses the concern that students may feel coerced to participate in the research, particularly if you are studying your own students.]

*For detailed information about protection of human subjects access:*

<http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.html>

### **Instructors**

If possible, both the intervention and comparison conditions should be taught by the same instructors. Having different instructors teach each condition makes it impossible to distinguish the effects of the intervention from the effects of the instructors.

### **Equivalence of Grades**

If final course grades are included as an outcome of your study, it is important to carefully examine whether the contributors to the final grades in the intervention and comparison groups are equivalent. For example, if the grading scheme in the intervention course includes extra credit and the grading scheme in the comparison course does not include extra credit, this might inflate the final course grades in the intervention course. One way to try to equate the grades might be to remove the extra credit and recalculate the final grades accordingly. You may also have to devise ways to try to equate grades, when there are subjectively graded



components (e.g., participation, discussion posts, papers) contributing to the final grade in one course and not in the others, particularly if these components were graded without the benefit of a rubric. Because subjectively graded contributors to final course grades typically have a narrower range of grades skewed toward the higher end of the grade distribution than objectively graded contributors (e.g., exams), they tend to increase final course grades. If you are in the planning stages of your study, you may be able to control the grading components so they are equivalent. If this is not possible, or if you are using pre-existing final grade data, a possible way to try to equate the grades would be to remove the subjective grading components and recalculate the final grades accordingly.

### **Measure Perceptions at More than One Time Point**

Measuring perceptions at two or more points in time (e.g., beginning and end of the semester) for both the intervention and comparison groups in your study is advantageous. With two or more measurements separated by time, mediational analyses can be performed that could potentially reveal the underlying mechanism/mediator of the intervention effects.

Understanding not only *that* an intervention works, but *why* it works is critically important as this knowledge can help to meaningfully shape new distance education and technological innovations.

Besides allowing statistical analysis of mediators/mechanisms underlying an intervention's effectiveness, a fuller understanding may emerge from measuring learner perceptions at two or more points in time. A one-shot measurement may reveal a difference between the intervention and comparison groups. However, with at least two measurement time points there is the possibility of detecting change due to the intervention. Clearly, demonstrated change in perception is a more valid measure (of change) than learners' retrospective report that change occurred. Whenever possible, measure change in perception rather than perception of change.

### **Figures Illustrating the Importance of Measuring Perceptions at More than One Time Point**

Figure A below shows a difference in students' sense of control, with students in the Intervention course reporting more perceived control than students in the Comparison course. At first glance, one may be tempted to prematurely conclude the Intervention led to this difference between the groups. But, without knowing students' ratings of perceived control in



the beginning of the semester, we do not know whether this assertion is correct as will become clear in Figures B-E.

Figures B-E depict ratings of perceived control at the beginning (Time 1) and end of the course (Time 3) for the intervention and comparison students. [Note that the data that created the difference displayed in Figure A was used to create the data for Time 3 in Figures B-E. With the same difference at Time 3, you would come to four different conclusions from the figures below depending upon the data from Time 1]. These figures show that knowing a difference exists between the groups at Time 3 in perceived control is not enough to fully understand the meaning of the difference. Figure B indicates the difference between the Intervention and Comparison students existed from the start. The intervention did not change students' perception of control. While in Figure C, improvement from Time 1 to Time 3 was shown for students in both the Intervention and Comparison courses. In Figure D, the data indicate that only the Intervention students improved in perception of control, while in Figure E, only the Comparison students decreased in perception of control.

Figure A

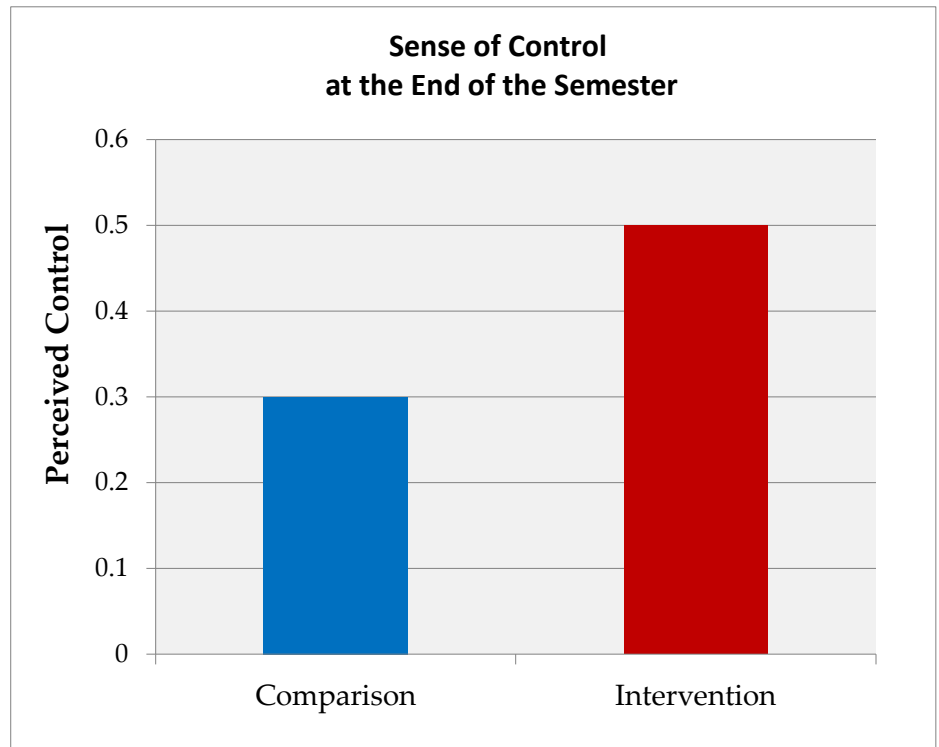






Figure B

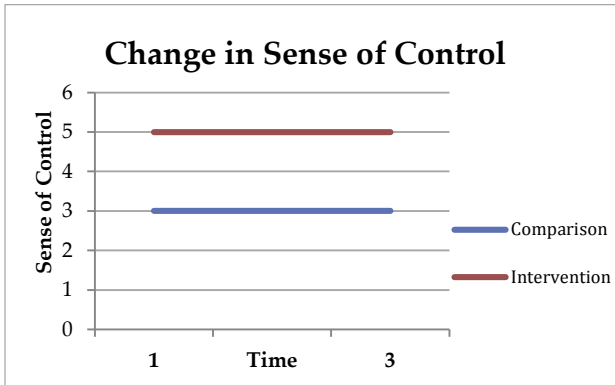


Figure C

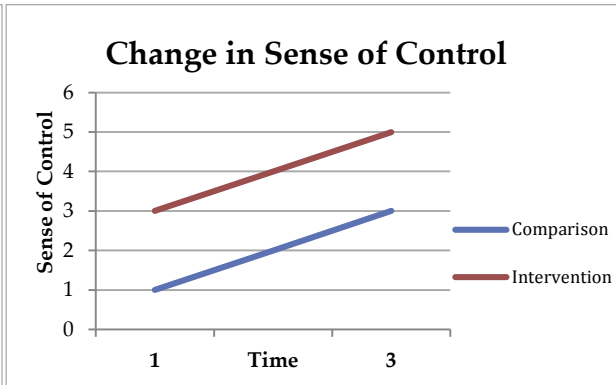


Figure D

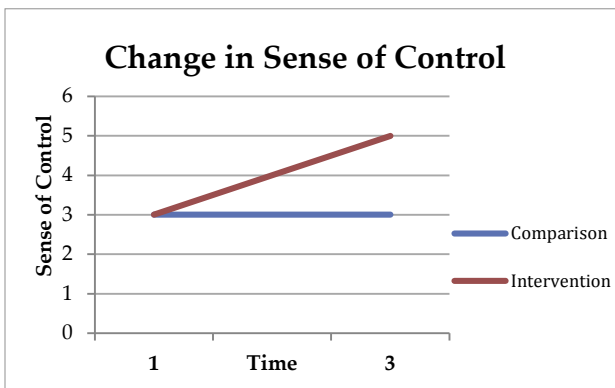
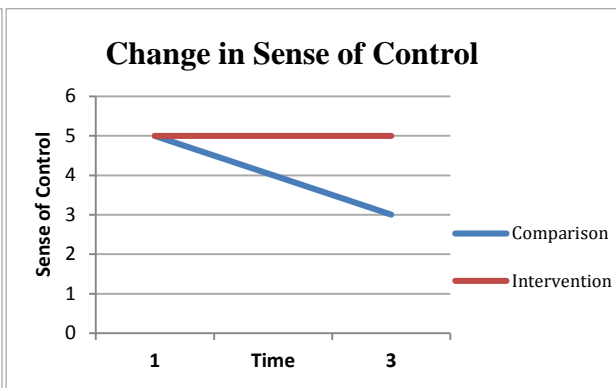


Figure E

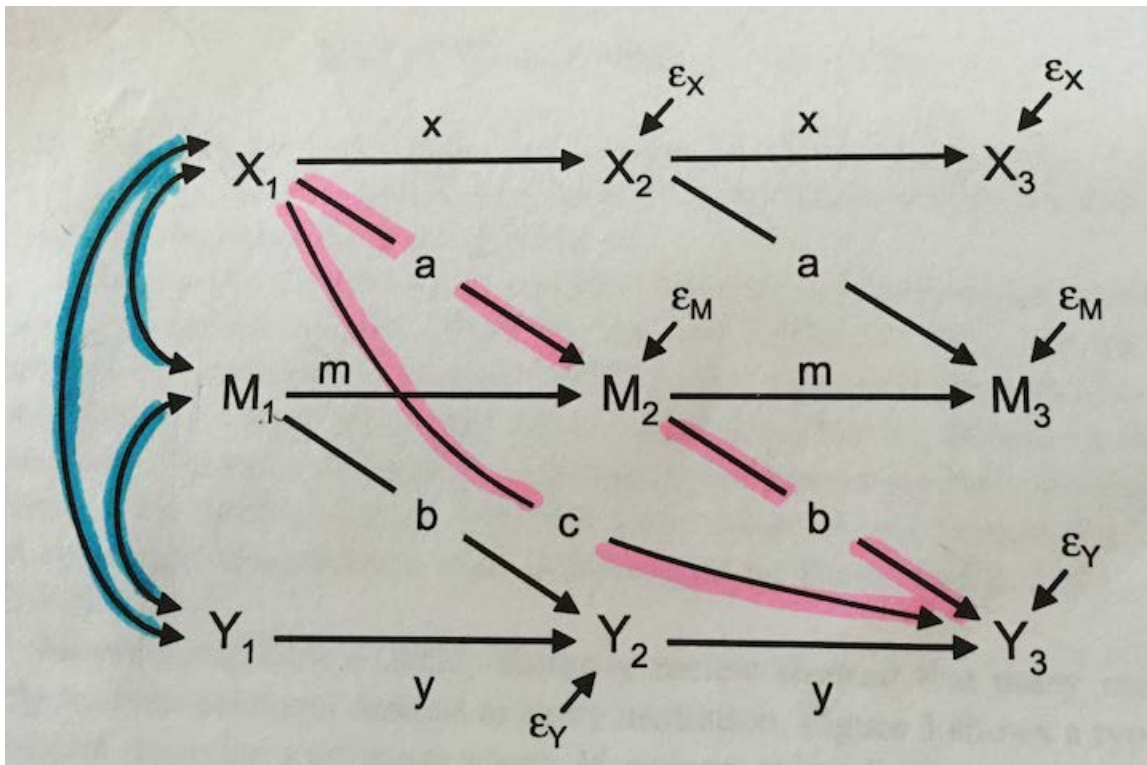


### Testing a Mediator of an Intervention Requires Measurement at More than One Point in Time

Although you may read published journal articles with one measurement time point that purport to have identified the mediator of an intervention, a true test of mediation requires more than one time point. Maxwell, Cole, and Mitchell’s figure below shows the importance of using multiple time points. The possible indirect effects of X on Y are depicted over time. All cross-lagged paths occur over one unit of time ( $t_1, t_2, t_3$ ). Maxwell et al. argue that to the extent that the *pink* path from manipulated intervention variable ( $X_1$ ) at time  $t_1$  and the possible mediator of the intervention effect ( $M_2$ ) at time  $t_2$  is nonzero and the path from  $M_2$  to  $Y_3$  at time  $t_3$  is also nonzero,  $M_2$  mediates the effect of the intervention ( $X_1$ ) on the outcome ( $Y_3$ ), reducing or eliminating the direct effect of  $X_1$  on  $Y_3$ . When we look at the variables  $X_1, M_1$ , and  $Y_1$  (all measured at time  $t_1$  – highlighted in *blue*), we can readily see that the indirect path, even if significant, does not allow time for the intervention to have its effect on the mediator, and for



the mediator to have its effect on the outcome. Analyses done in this manner typically depict the relationships between X, M, and Y at the end of the intervention study, making it impossible to determine what variable may have caused what. Therefore, it may be optimal to measure all three variables at least at two points in time, and preferably at three points in time, to reveal a fuller picture of any possible mediation of the intervention effect.



Source: Maxwell, S. E., Cole, D. A., & Mitchell, M. A. (2011). Bias in cross-sectional analyses of longitudinal mediation: Partial and complete mediation under an autoregressive model.

*Multivariate Behavioral Research*, 46 (5), 816-841. <http://dx.doi.org/10.1080/00273171.2011.606716>



# Survey Research Design



*A practical guide to conducting survey research is provided. Reference in developing a proposal in response to the call.*

## A Practical Guide to Survey Research

Survey designs are a series of questions in which responses are collected in order to draw conclusions using tests of association (e.g., correlation, regression). Many times several surveys measuring numerous variables are put together in a survey packet. The DETA Research Center has put together survey instruments to measure variables in the framework of inquiry (see <http://uwm.edu/deta/framework-of-inquiry/>) in order to answer the top research questions identified by a group of national experts at the DETA Summit (see <http://uwm.edu/deta/summit/>) held in February of 2015 at the ELI Annual Meeting in Anaheim. These surveys are student-reports of their own learner characteristics, characteristics of the course or program, perceptions of the course and their behaviors within the course, and perceptions of their student outcomes. Responses to these individual items on each survey will be analyzed using factor analysis and then univariate and multivariate analysis will be conducted.

Surveys allow researchers to obtain data from large random samples of people and allow for more robust conclusions. They take place in naturalistic settings allowing for greater generalizability. In this instance, the research is taking place in natural education settings for the examination of student access and success through distance education. Survey designs are convenient if instrumentation is available since they can be administered to the identified sample whereas creating control and variable conditions needed for experimentally designed studies can be a challenge in natural education settings. Remember, survey designs can help illustrate relationships between variables, but do not provide evidence for causation or cause-effect.

To get started on your survey designed study, please take the following steps:

**Step 1: What is the guiding research question(s)? What more specific research questions and hypotheses can be studied?**



A clear overarching research question with more specific research questions and/or hypotheses need to be written. The study may have multiple research questions. The DETA Summit resulted in many top general research questions (see: <http://uwm.edu/deta/top-research-questions/>). These overarching research questions can be used to guide your research. However, more specific research questions and hypotheses may need to be developed. They need to be specific and concise. It will identify the variables and a relationship. Incorporating the variables into a clear and concise statement, or research question, which shows a relationship between the variables to be measured is needed.

Research questions that are most appropriate for survey research include:

1. What are the different design components (content, interactivity, assessments) that impact student learning?
2. What patterns of behaviors lead to increased student learning for different populations?
3. What support structures are critical to providing quality access to online instruction?

After identifying a guiding research question, generate more specific research questions and hypotheses. Include in the research question and hypotheses potential variables. We will explore variables in more detail next.

## **Step 2: What variables will be examined?**

The variables that will be examined to address the purpose of the evaluation need to be isolated. Variables are a “characteristic or attribute...that researchers can measure or observe” (Creswell, 2008, p. 123). This will help in determining what factors, such as student demographics, learning, or satisfaction, will be measured. One should identify appropriate variables and emphasize the importance of staying focused on the selected variables through the duration of the research. For instance, the purpose may be to evaluate how online learning impacts student achievement, but how can student achievement be measured? Student achievement is a construct because it is abstract, while grade point average is a variable that can be measured and analyzed. Therefore, it is important to determine which variables will be



used keeping in mind what is measurable. Variables from the Framework of Inquiry that are most relevant to the research questions may include:

1. What are the different design components (content, interactivity, assessments) that impact student learning?

Possible variables: Learner characteristics of income, ethnicity/race, first generation, and disability, course characteristics (level, topic, major), including instructional characteristics of content, interactivity, and assessment, and student outcomes of learning, performance, and satisfaction.

2. What patterns of behaviors lead to increased student learning for different populations?

Possible variables: Learner characteristics of income, ethnicity/race, first generation, and disability, course characteristics (level, topic, major), student perceptions and behaviors (engagement, interactivity, active learning behaviors) and student outcomes (learning, performance, and satisfaction). Possibly instructional characteristics of content, interactivity, and assessment.

3. What support structures are critical to providing quality access to online instruction?

Possible variables: Learner characteristics of income, ethnicity/race, first generation, and disability, course characteristics (level, topic, major), instructional characteristics (learner support), program characteristics (frequency and usefulness of support services), and student outcomes (learning, performance, and satisfaction). Possibly instructional characteristics of content, interactivity, and assessment. Optional may be student perceptions and behaviors (engagement, interactivity, active learning behaviors)

A complete list of variables, measures, definitions, and coding can be found in the Data Codebooks section.



### **Step 3: Which instruments will you use?**

From the survey packet, identified which surveys will assist you in measuring the variables of interest.

1. What are the different design components (content, interactivity, assessments) that impact student learning?

Instruments: learner characteristics, course characteristics, including instructional characteristics, and student outcomes.

2. What patterns of behaviors lead to increased student learning for different populations?

Instruments: learner characteristics, course characteristics, student perceptions and behaviors, and student outcomes. Optional, instructional characteristics.

3. What support structures are critical to providing quality access to online instruction?

Instruments: learner characteristics, instructional characteristics, in particular learner support, program characteristics, and student outcomes. Optional, student perceptions and behaviors.

See the Data Collection section for a complete list of instruments available in the survey packet and other variables than can be captured from institutional data sources.

### **Step 4: Who is your sample?**

One strategy to identify students to participate in your survey research is to identify instructors to deliver the survey to students, the participants. Instructors who teach blended and/or online courses can be identified through institutional records (e.g., registrar's office, institutional research). If one is not already compiled, you will need to gather an email list of instructors who are teaching a blended/online course. These instructors and their participation



can be solicited through an email. Many times this communication can be sent by instructional support staff, but may be received more positively if coming from administration (e.g. chair, dean, provost, or president). The instructors who identify as interested in participating in this national study can then disseminate information on the survey and a link to the online survey (which may include multiple instruments) to their students within their online classes (see Appendix B for sample student communication). Sometimes instructors can provide an incentive to students for participating in the study as well. You will want to try to ensure that the courses which are identified by their instructors or representatives of the online programming on your campus are diverse (a range of disciplines, course levels, and course sizes). This will provide more generalizable results.

### **Step 5: What is the timeline for the research?**

Here are some steps that will need to be taken to complete the study. Make sure to set deadlines for each of the following. Tip: Don't wait for one task to be completed necessarily before starting on the next step.

- 1.) Completing IRB forms and receiving IRB approval.
- 2.) Contacting individuals who will be gathering and analyzing data (research support).
- 3.) Identify or develop survey items.
- 4.) Gathering course and program level data from contacts (advisors, chairs, deans, instructors, student support services, faculty support services).
- 5.) Developing a complete list of courses and programs and date of delivery.
- 6.) Administering data collection (survey). Survey details are available in the Data Collection section.
- 7.) Collecting student information from other institutional data sources (demographics and performance data). See more in the Data Collection section.



- 8.) Potentially cleaning up the data, recoding variables to match the required DETA coding (see codebook in following section).
- 9.) Analyzing data and/or submitting to DETA for analysis using the DETA Excel spreadsheet.
- 10.) Develop written results and/or presentable form of results, including graphic representations of the results (bar charts, graphs). Sample will be provided.

Note: The DETA Research Center will administer surveys through a cross-institutional survey tool. Institutions may need to provide program, course, and student identifiers to facilitate collection of survey data. Moreover, data submission forms will be provided and potentially access to a data import tool for data mined from data warehouses and student information systems. The actual instruments and codebooks are shared in the following section.

If you have any questions, please don't hesitate to contact the DETA team at [deta-staff@uwm.edu](mailto:deta-staff@uwm.edu) or via Twitter at @UWMDETA.

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# Data Collection

Data can be collected from several sources as outlined in the Study Guides. This section describes procedures and protocols to assist in the collection of data from institutional warehouse data and surveys. In particular, this section provides you with background information to assist you in collecting data from institutional warehouse data, student-level and course-level data, that can be merged with data from experimental studies and student reported data from survey studies.

## Institutional Warehoused Data



*Describes procedures in gathering data warehoused at the institution.*

Data can be collected from existing data technology storage locations, usually called data warehouses or student information systems (SIS). Collecting this data allows researchers to draw conclusions using tests of variance and association (e.g., ANOVA, MANOVA, correlation, regression). As mentioned, the DETA Research Center has put together variables and measures in the framework of inquiry (see <http://uwm.edu/deta/framework-of-inquiry/>) in order to answer the top research questions identified by a group of national experts at the DETA Summit (see <http://uwm.edu/deta/summit/>), which was held in February of 2015 at the ELI Annual Meeting in Anaheim, CA. Furthermore, the DETA Research Center has identified specific measures that can be collected through the data warehouses. Many variables were derived from the national Summit activities, current reports from Predictive Analytics Reporting (PAR) Framework and Integrated Postsecondary Education Data System (IPEDS) as highlighted in the Summit activities. These data provide information on learner characteristics, course characteristics and student outcomes.

The data collected through these systems can be linked to data collected from experimental and survey studies through unique student or learner identifiers (e.g., email address) and analyzed using various univariate and multivariate analysis (e.g., T-tests, regression techniques, hierarchical linear modeling, and/or structural equation modeling). This is important since student reported information through surveys may be inaccurate or partially reported. Once data gatekeepers are identified, members at your institution that can grant access to the data, data can be easily exported from data warehouses to help better understand the relationships between variables.



Preparing to gather student and course data housed in these storage facilities requires several important steps. First, identify if you have direct access to the data. Second, if you do not have direct access to the data, it will be important to identify what unit oversees the data (e.g., student grades, student demographics, course information) found in the data warehouse or student information system as well as who might be the data stewards. Oftentimes, a unit on campus within Institutional Research, Information Technology, Student Services, the Registrar's Office, or Academic Affairs serves as the access point to this data. Third, consider whether you need to create a request to access the data. Determine the length of the request (e.g., is the request 3 pages or 23 pages long). Finally, consider whether you need IRB approval to obtain the data.

The DETA Research Center has identified a list of variables and measures that can be extracted from these sources. Also, definitions and coding of the data are illustrated to facilitate cross-institutional analysis and findings (see the section containing Data Codebooks for further information). It is important that you verify the variables and measures of the data to be collected from the data warehouse. Moreover, it is important to locate the identifiers for online and blended courses or determine how you will identify which student data needs to be collected and for which courses as identified in the study sample. The terms (e.g., semester/s) in which you will gather the data needs to be identified. Remember to not pull the data during drop and withdrawal windows. Pull archived data when the course has been completed.

Once the data is collected from the data warehouse, it may require some recoding and formatting prior to analysis and submission to the DETA Research Center. An institutional codebook that includes the values of the data collected may be useful for the data recording process. Importantly, the DETA Research Center can provide SPSS syntax to assist with data recording. Once data is recorded with the appropriate values to facilitate cross-institutional research and contains the important identifiers for your institution (to be assigned by the DETA Research Center) and students, it can be exported into a comma separated value file or Excel file for submission. The DETA Research Center will provide the appropriate file formatting, column headers, and import process.



Resources:

Integrated Postsecondary Education Data System

<https://nces.ed.gov/ipeds/>

Predictive Analytics Reporting (PAR) Framework

<http://www.parframework.org/>



# Survey Instrument Development



*A description of the process of survey instrumentation development is provided.*

A survey packet was developed for the DETA survey designed research to be conducted as described in the survey study guide. The survey packet includes several surveys that measure numerous variables as illustrated in the framework of inquiry. The items are organized by measure and variable. Several of these variables related directly to the research questions identified in the development of the research model. There are many additional surveys that are included to provide additional opportunities for study of important variables and relationships of variables in distance education. This section describes the process of developing the survey instrument packet.

## Developing the DETA Survey Packet

### **(1) Consult Experts on Key Elements for Characteristics**

Prior to even beginning the literature search, it is important to hear from the experts in the field who are currently engaging in research as to what they consider to be key measures, concepts, and variables. The DETA Research Center called upon approximately 50 experts in distance education and competency based education to collaboratively come up with their answer to the question: “What are the key measures and research questions we should be asking?” From their responses, the DETA team compiled a list of concepts and idea specific to instructional/course characteristic. See <http://uwm.edu/deta/summit/>.

### **(2) Engage in Literature & Compile List of Previously Instruments**

The next step is to systematically review the literature and research, focusing on uncovering the most valid and reliable items previously used to investigate learner characteristics, instructional and course characteristics, student perceptions and behaviors, and student outcomes. The DETA Research Center found the most widely used and cited instruments and developed a comprehensive list of each item used, citing each individual item in the list for future reference. Many instruments have been used at UWM to evaluate technological and pedagogical practices within internal innovation projects for a decade. See references below.



### **(3) Use Expert-Developed Classifications to Group Previously Used Items**

Once a thorough list of items is developed, the next step is to go through a classification process. The DETA Team took the list of concepts and ideas formulated by our experts and went through each individual item to determine where that item fell. We asked ourselves, “What idea or concept is that item tapping into?” “What would a student’s response to this item help us better understand about student access and success?”

### **(4) Run Through Item-Cleansing Process**

After each item has been sorted, it is necessary to go back and review the similarities between items within the same concept/classification. In some instances, items will be worded the exact same way and, therefore, the decision to delete one is easy. Other items may have differing degrees of similarities that you as the researcher, having consulted the literature, will need to address. The DETA Team took two strategies to the item-cleansing process. First, the team tried to combine items for wording and phrasing purposes whenever possible. Second, the team decided to remove items where words or ideas were not intuitive for students.

### **(5) Consult the Experts, Again**

Finally, a seventh or eighth set of eyes never hurts. Additional experts in the field are invited to provide input and feedback on the newly developed instrumentation.

### **To Make a Long Story Short...**

- Find out the key concepts/ideas within the field from the experts
- Look into what instruments are currently being used
  - Which are the most valid; most reliable?
  - Which have been used the most?
- Create a massive list of all the items from each relevant instrument
- Map those items onto the concepts/ideas from experts to create a classification system
- Review the list
  - Clean up any duplicate items
  - Combine items wherever possible
  - Remember who your audience is
- Consult the experts, again



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# Student Survey Instrumentation Packet



*Survey items to be administered to students to collect data of variables at differing levels of the input-throughput-process guided by the Framework of Inquiry.*

## Learner Characteristics

### **Demographics**

#### Gender

Variable Name: GEN

Which restroom do you choose?

0 = Men

1 = Women

#### Age

Variable Name: AGE

When is your birthday? <mm/dd/yyyy>

#### Ethnicity

Variable Name: ETH

Do you identify as Hispanic?

1 = Hispanic

0 = Non-hispanic

99 = Unknown

#### Race

Variable Name: RACE

With which race do you identify?



- 1 = American Indian or Alaska Native
- 2 = Asian
- 3 = Black or African American
- 4 = Native Hawaiian or Other Pacific Islander
- 5 = White
- 6 = Two or more races
- 99 = Unknown

First Generation

Mother's Education

Variable Name: MEDUC

What was the highest school completed by your mother or parent 1?

Middle school/Jr. high

High school

College or beyond

Other/unknown

Father's Education

Variable Name: FEDUC

What was the highest school completed by your father or parent 2?

Middle school/Jr. high

High school

College or beyond

Other/unknown

Income

Family Income

Variable Name: FAMINC

What was your household or parent's adjusted gross income upon high school graduation?



Student Income

Variable Name: STUINC

What was your (and spouse's) adjusted gross income last year?

Pell Grant Eligible

Variable Name: PGE

Are you eligible for or have you received a Pell grant?

Yes

No

Other, Don't know

Orphan

Variable Name: ORPHAN

At any time since you turned age 13, were both your parents deceased, were you in foster care, or were you a dependent or ward of the court?

Yes

No

Other, Don't know

Marital Status

Variable Name: MARSTATUS

What is your marital status?

I am single

I am married

I am separated

I am divorced or widowed

Grade Level

Variable Name: GRDLVL

What year are you?

Freshman



- Sophomore
- Junior
- Senior
- Graduate Student
- Other

Time Commitment

Paid Work Hours

Variable Name: WRKHRS

How many hours do you work per week on average?

Employment Type

Variable Name: EMPSTAT

What is your employment status?

Unemployed, not looking for work

Unemployed, looking for work

Part time

Full time

Other

Student Type

Variable Name: STUTYPE

What is your student enrollment status?

Less than part time

Part time

Full time

Overload

Don't Know

Credit Hours

Variable Name: CDTHRS



How many credits did you take last semester? If you are a student in a competency based program and do not have semesters, please enter how many credits have you completed in the last six months?

### Functional Impairment

#### Cognitive

Variable Names: IMPCOGN1 - IMPCOGN12

*12-items; Yes/No Responses → (0) "No" (1) "Yes"*

1. I have difficulty with reading.
2. I have difficulty with mathematical reasoning.
3. I have difficulty with written expression.
4. I have difficulty with spoken expression.
5. I have difficulty with receptive communication and comprehension.
6. I have difficulty with time management.
7. I have difficulty with speed of processing information.
8. I have difficulty with memory recall.
9. I have difficulty with sustained concentration.
10. I have difficulty with attentional focus.
11. I have difficulty with problem solving.
12. I have difficulty with logical reasoning.

#### Sensory

Variable Names: IMPSENS1 - IMPSENS3

*3-items; Yes/No Responses → (0) "No" (1) "Yes"*

1. I have difficulty with hearing.
2. I have difficulty with vision.
3. I have difficulty with visuo-spatial reasoning.

#### Behavior

Variable Names: IMPBEHV1 - IMPBEHV9

*9-items; Yes/No Responses → (0) "No" (1) "Yes"*





1. I have difficulty with anxiety.
2. I have difficulty with stress regulation.
3. I have difficulty with mood regulation.
4. I have difficulty with social awareness.
5. I have difficulty with appropriateness of social interaction.
6. I have difficulty with flexibility.
7. I have difficulty with adaptability.
8. I have difficulty with non-verbal communication comprehension.
9. I have difficulty with impulse control.

### Motor

Variable Names: IMPMOTOR1 - IMPMOTOR4

*4-items; Yes/No Responses → (0) "No" (1) "Yes"*

1. I have difficulty with fine motor control.
2. I have difficulty with gross motor control.
3. I have difficulty with general body stamina.
4. I have difficulty with balance.

### Assistive Technology

#### Communication Aid

Variable Names: ATCOMM1 - ATCOMM20

*20-items; Yes/No Responses → (0) "No" (1) "Yes"*

1. I use a communication board.
2. I use a speech synthesizer.
3. I use text-to-speech software.
4. I use text-to-speech hardware.
5. I use a head wand.
6. I use a light pointer.
7. I use a signal system.
8. I use telephony equipment.
9. I use a tactile device.



10. I use a Braille device.
11. I use word prediction or completion software.
12. I use an assistive listening device.
13. I use hearing aids.
14. I use an infrared or personal amplification system.
15. I use an FM amplification system.
16. I use a TDD/TTY device.
17. I use a cochlear implant.
18. I use a visual signaling or alerting system.
19. I use a speakerphone
20. I use a communication aid not previously mentioned.

#### Computer Access Aid

Variable Names: ATCOMP1 - ATCOMP22

*22-items; Yes/No Responses → (0) "No" (1) "Yes"*

1. I use an alternative or adaptive keyboard.
2. I use an expanded keyboard.
3. I use a head-operated pointing device.
4. I use an eye gaze pointing device.
5. I use a mouth or tongue pointing device.
6. I use a brain-actuated pointing device.
7. I use a Morse code input device.
8. I use a switch.
9. I use a touch screen.
10. I use a voice input system.
11. I use speech-to-text software.
12. I use dictation software.
13. I use on-screen keyboards.
14. I use a Braille display or output device.
15. I use a Braille embosser or printer.
16. I use screen reading software.
17. I use screen enlargement or magnification software.



18. I use a large print monitor.
19. I use an Optical Character Recognition (OCR) system.
20. I use a manual or electronic page turner.
21. I use audio or electronic textbooks.
22. I use a computer access aid not previously mentioned.

### Mobility Aids

Variable Names: ATOTH1 - ATOTH5

*5-items; Yes/No Responses → (0) "No" (1) "Yes"*

1. I use an ambulatory aid.
2. I use a scooter or power chair.
3. I use a wheelchair.
4. I use a walker.
5. I use a mobility aid not previously mentioned.

### Other Modification

Variable Names: ATMOBIL1 - ATMOBIL5

*5-items; Yes/No Responses → (0) "No" (1) "Yes"*

1. I use a personal aide.
2. I utilize an interpreter.
3. I have a personal tutor.
4. I utilize a group tutor.
5. I use a modification or accommodation not previously mentioned.

### Prior Academic Achievement

#### Current Overall GPA

Variable Name: OVERGPA

What is your Current Overall GPA?

#### Class Rank

Variable Name: CLASSRNK



What is your current class rank?

Current Major GPA

Variable Name: MAJORGPA

What is your GPA in your major?

Degree Completion Progress

Variable Name: DEGPROG1 - DEGPROG2

1. How far along in your degree completion are you?

0-25%

26-50%

51-75%

76-99%

100%

2. How many credits have you completed towards your degree?

Native English Speaker

Variable Name: ENGLISH

Is English your first language?

Yes

No

Disability

Physical Disability

Variable Name: PHYDIS

Do you have a disability or require special accommodations in class?

Yes

No



Learning Disability

Variable Name: LRNDIS

Were you ever diagnosed by a physician or psychologist as having a learning disability?

Yes

No

Mental Illness

Variable Name: MENILL

Have you been diagnosed by a professional as having a learning disability?

Yes

No

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**Preparedness and Readiness**

Experience in distance education

Variable Names: PREPDEEXP1 - PREPDEEXP2

*2-items; continuous responses or unknown*

How many previous online courses have you taken?

How many previous blended or hybrid courses have you taken?

Access to technology and environment

Variable Names: PREPTECH1 - PREPTECH3

*3-items; Yes/No Responses → (0) "No" (1) "Yes"*

1. I have a computer or a laptop.
2. I have the Internet in my home or somewhere I can study online.
3. I have a good environment in which to study for my online course.



### Online skills proficiency

Variable Names: PREPSKILLS\_A1 - PREPSKILLS\_A16

16-items; 5-point Likert Scale; Ranges → (1) “Strongly Disagree” to (5) “Strongly Agree”

Bernard et al (2004)

1. I am able to easily access the Internet as needed for my studies.
2. I am comfortable communicating electronically.
3. I am willing to actively communicate with my classmates and instructors electronically.
4. I feel that my background and experience will be beneficial to my studies.
5. I am comfortable with written communication.
6. I possess sufficient computer keyboarding skills for doing online work.
7. I feel comfortable composing text on a computer in an online learning environment.
8. I feel comfortable communicating online in English.

Adapted from Roblyer et al (2008)

9. I know how to use an Internet search engine to locate information.
10. I know how to use a browser to locate Internet sites.
11. When I have to do something on a computer, I usually try to figure it out myself.
12. I know how to locate a document or a program on my computer.
13. I feel comfortable using a computer.
14. I know how to send an attachment in an email.
15. I use email, instant messaging, or text messaging at least once a week.
16. I have good word processing skills.

### Technology familiarity

Variable Names: PREPFAM1 - PREPFAM11

11-items; 5-point Likert Scale; Ranges → (1) “Never” to (5) “Very Frequently”

Adapted from Joosten (2015)

“When you use a computer/laptop, tablet, or phone with Internet access, how often do you:”

1. Send or receive email



2. Chat using instant messenger (iMessage, Google Hangouts+, AIM)
3. Play games
4. View videos or pictures
5. Use Social Media (Instagram, SnapChat, Facebook, Twitter)
6. Use Video Conferencing (Skype, FaceTime, Blackboard Collaborate)
7. Read or watch the news
8. Read eBooks (Kindle, iPad)
9. Take pictures
10. Take videos
11. Access the Learning Management System, e.g., Desire2Learn or Blackboard

### Organization

Variable Names: PREPORG1 - PREPORG5

*5-items; 5-point Likert Scale; Ranges → (1) "Strongly Disagree" to (5) "Strongly Agree"*

Adapted from Roblyar et al (2008)

1. I tend to make a schedule or list when I have a lot to do to make sure I get everything done on time.
2. I keep notes on each subject together and arranged in a logical order.
3. I keep my desk, or the place where I work, very organized.
4. I feel I am a very well-organized person.
5. I tend to wait until the last minute to get things done. (r)

### Online learning efficacy

Variable Names: PREPSE1 - PREPSE7

*7-items; 5-point Likert Scale; Ranges → (1) PREP "Strongly Disagree" to (5) "Strongly Agree"*

Adapted from Bernard et al (2004)

1. I am motivated by the material in online activities.
2. Learning is the same in class and at home online.
3. I feel that I can improve my listening skills the same working online as in an in-person class.
4. I believe that learning online is more motivating than a traditional in-person course.



5. I believe a complete course can be given online without difficulty.
6. I could pass a course online without any teacher assistance.
7. I believe that material in an online course is better prepared than a traditional class.

### Self-directedness

Variable Names: PREPSD1 - PREPSD15

15-items; 5-point Likert Scale; Ranges → (1) "Strongly Disagree" to (5) "Strongly Agree"

Adapted from Bernard et al (2004)

1. When it comes to learning and studying I am a self-directed, take charge kind of person.
2. In my studies, I am self-disciplined and find it easy to set aside reading and homework time.
3. I am able to manage my study time effectively and easily complete assignments on time.
4. In my studies, I set goals and have a high degree of initiative.

Adapted from Carson (2012); Lounsbury, Levy, Park, Gibson, & Smith (2009)

5. I regularly learn things on my own outside of class.
6. I am very good at finding out answers on my own for things that the teacher does not explain in class.
7. If there is something I don't understand in a class, I always find a way to learn it on my own.
8. I am good at finding the right resources to help me do well in school.
9. I set my own goals for what I will learn.
10. I like to be in charge of what I learn and when I learn it.
11. If there is something I need to learn, I find a way to do so right away.
12. I am better at learning things on my own than most students.
13. I am very motivated to learn on my own without having to rely on other people.
14. I do not need much help to complete my homework.
15. Taking charge of my own learning is very important for success in my school and future career.





### Experimentation and growth

Variable Names: MINDSETRE1 - MINDSETRE17

6-items; 5-point Likert Scale; Ranges → (1) "Strongly Disagree" to (5) "Strongly Agree"

Adapted from Roblyer et al. (2008)

1. I do not care what other people think of me if I make mistakes.
2. I am not afraid of making mistakes if I am learning to do new things.
3. I don't mind showing my work in front of others when I am learning new things.
4. If I am given a task to perform that I know little about, I don't mind giving it a try.
5. When I am learning something new, it is okay if I make errors.
6. I am afraid of failure when I am learning new things. (r)

Adapted from Blackwell, Trzesniewski, & Dweck. (2007)

7. Your intelligence is something about you that you can't change very much. (r)
8. No matter who you are, you can significantly change your intelligence level.
9. To be honest, you can't really change how intelligent you are. (r)
10. No matter how much intelligence you have, you can always change it a good deal.
11. You can learn new things, but you cannot really change your basic level of intelligence. (r)
12. I like my work best when it makes me think hard.
13. I like my work best when I can do it really well without too much trouble.
14. I like work that I'll learn from even if I make a lot of mistakes.
15. I like my work best when I can do it perfectly without any mistakes.
16. When something is hard, it just makes me want to work more on it, not less.
17. To tell the truth, when I work hard, it makes me feel as though I'm not very smart.

### Achievement

Variable Names: PREPACH1 - PREPACH21

21-items; 5-point Likert Scale; Ranges → (1) "Strongly Disagree" to (5) "Strongly Agree"

Roblyer et al 2008

1. Many times I lose interest in attaining the goals I set. (r)
2. I rarely set goals for myself. (r)



3. I find that I try harder if I set high goals for myself.
4. I study hard for all of my classes because I enjoy acquiring new knowledge.
5. I tend to persist at tasks until they are accomplished.
6. I believe I am a high achiever.
7. I believe that I am a valuable person.
8. I feel that I am a worthy individual.
9. I try to achieve in all my classes, regardless of their level of difficulty.
10. As classes become harder, I feel that I have the ability to overcome many of the difficult obstacles that may present themselves.
11. I have a need to achieve and feel competent.
12. It is important that my teachers give me knowledge of results or feedback that I can use to further enhance my performance.
13. I take responsibility for my actions most of the time.

Adapted from Yee (2007)

14. I want to become powerful.
15. I hope to accumulate items and money.
16. It is important to be well-known.
17. I like knowing as much as possible about my major.
18. I like to compete with peers or family.
19. My goal is to complete my degree.
20. I plan to have a successful career.
21. I hope to get a well paying job.

### Socialization

Variable Names: PREPSOC1- PREPSOC14

Adapted from Bernard et al (2004)

1. As a student, I enjoy working with other students in groups.
2. I feel that face-to-face contact with my instructor is necessary for learning to occur.
3. I can discuss with other students during Internet activities outside of class.
4. I can work in a group during Internet activities outside of class.
5. I can collaborate with other students during Internet activities outside of class.



Adapted from Yee (2007)

6. I like getting to know other students.
7. I like helping other students.
8. I often have meaningful conversations with other students.
9. I sometimes talk to other students about personal issues.
10. Other students sometimes help me with my real life problems.
11. I am self-sufficient and seldom need the assistance of others. (r)

Adapted from Joosten (2015)

12. I need to be able to develop relationships to learn.
13. I need to feel connected in order to learn.
14. I need frequent communication from my instructor (e-mail, announcements, discussion posts, grade feedback).

### Enrollment motivation

Variable Name: PREPENRL1 - PREPENRL31 -- this should be 31.

*32-items; 5-point Likert Scale; Ranges → (1) "Strongly Disagree" to (5) "Strongly Agree"*

Adapted from Roblyer et al. (2008)

1. I like to control the course pace and time of learning activities.
2. I prefer traditional, face-to-face class meetings.
3. I prefer student-instructor interaction.
4. I would prefer to work at home or remotely than have to drive to campus.

Adapted from Kizilcec, R. F., & Schneider, E. (2015) - MOOC/Stanford

5. I enrolled in this course because I have a general interest in the topic.
6. This course is relevant to my job.
7. I am taking this course because it is relevant to my degree program.
8. This course is relevant to academic research.
9. I enrolled in this course for personal growth and enrichment.
10. This course will help me with a career change.
11. I am taking this course for fun and challenge.
12. I was hoping to meet new people in this course.
13. I enrolled in this course to experience an online course.



14. My goal in the course is to earn a certificate.

Newly developed from UW Flex (See Appendix A)

Learning Goals

15. I want to become a better person.

16. I believe it will help me grow as a person.

17. I hope to improve my problem solving ability.

18. I want to learn as much as I can on this topic.

19. It is important for me to generally become more knowledgeable.

Professional Goals

20. I want to try a new career.

21. I hope to advance in my current career.

22. I believe it will make me more marketable to future employers.

23. I want to increase my job security.

Academic Goals

24. Continuing my education is one of my personal goals.

25. I want to apply my previously earned credits toward a degree.

26. I hope it will be a stepping stone to a more advanced degree program.

Social Goals

27. I want to use the things I learn to help others.

28. I believe it will help me make a difference in society.

29. I want to provide a good example for my friends and family.

30. I want to encourage my friends and family in their current studies.

31. My friends and family expect me to continue my studies. (r)

*Qualitative Questions*

Variables: PREPENRLQ1 - PREPENRLQ2

1. Why did you choose to take this course in the mode you did (blended or online) rather than as a completely traditional face-to-face course?
2. Which of your skills or experience were most helpful in preparing you for this course? Explain.



## Course Characteristics

### Course Level

Variable Name: CRSLEVEL

What is the course level?

- 1 = undergraduate 100-200 level (general education course)
- 2 = undergraduate 300 level or greater (course within major)
- 3 = undergraduate 100-200 elective
- 4 = undergraduate 300 level or greater elective
- 5 = graduate course

### Course Department

Variable Name: CRSDEPT

Which department is this course?

### Course Mode

Variable Name: CRSMODE

What is the course mode?

- 1= F2F
- 2 = Blended/Hybrid
- 3 = Online
- 4 = Other, describe?

### Course/Program Design

Variable Name: CRSDSIGN

What is the course or program design, if applicable?

- 1= Competency-based education
- 2 = Self-paced (e.g., U-Paced)
- 3 = Traditional, not specially designed course or program



4 = Other, don't know

\*check all that apply

Course Content/Topic

Variable Name: CRSTOPIC

What is the topic of the course?

Text entry

Course in Plan of Study for Major

Variable Name: CRSMAJOR

What kind of course is this?

1 = GER, required for degree

2 = Required for major

3 = Elective, Not required for major

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Instructional Characteristics

Learner Support

Variable Names: ICLEARNS1 - ICLEARNS29

29-items; 5-point Likert Scale; Ranges → (1) "Strongly Disagree" to (5) "Strongly Agree"

Orientation

-Orientation to course

1. The instructor identified which materials were required (need to know) and which materials were optional or supplemental.
2. The materials included activities, such as a scavenger hunt or quiz, to orient me to the course.
3. The introductory explanations on how to get started in the class were clear.
4. Course description included the purpose and format of the course.



5. Instructor provided students with adequate notice and time to acquire course materials.
6. Requirements for my interaction with the instructor, content, and other students was clearly explained.

-Orientation to course policies

7. Academic integrity or “code of ethics” was explained or a link included.
8. Online etiquette (or “netiquette”) guidelines and expectations for how to communicate and behave online was clearly stated.

-Directions and expectations

9. The relationship between the course materials and the activities was clear.
10. I understood all components of the activities.
11. The instructions for the class were clear.
12. Expected outcomes for the course and the course activities were provided at the beginning of the semester.
13. Expectations of the instructor’s role within the course were clearly stated either verbally or within the syllabus.
14. Grading expectations (i.e., grading scale) were explained or provided within the syllabus.
15. Rubrics were provided to help me understand what was expected of me in learning activities.

Access

- Technology access

16. Technologies required for the course were readily available, provided in the course site, and/or easily downloadable.
17. The course materials were easy to access (available online or easily downloaded for use offline).
18. The course design took full advantage of available tools and media.
19. Technologies were convenient or easily accessible when and where I needed to use them.
20. Instructions were provided for how to use technologies.
21. Information about where to find technology assistance was provided.

- Access to support



22. The instructor stated her/his role in supporting students in the course.
23. The materials included or had links to a clear explanation of the technical support available to me.
24. The materials included or had links to a clear explanation of the academic support services (e.g., writing center, tutoring, mentoring, and/or advising) available to me.
25. The materials included links to tutorials and resources that answer basic questions related to research, writing, and technology.
26. I had adequate support in completing my activities.
  - Accessibility
27. Students were given information and policies when accommodations are needed.
28. Accessible course materials and activities were provided (e.g., text alternatives for audio or video materials).
29. An explanation of the process a student should undertake if s/he needed accommodations beyond what was already provided.

*Open-Ended Qualitative Questions*

Variable Names: ICLEARNSQ1 - ICLEARNSQ2

Q1. Where would you recommend an institution or program invest resources to better serve you as a student taking blended or online courses? Why?

Q2. What support services would you like your campus to offer its online students?

Design and Organization

Variable Names: ICDESIGN1 - ICDESIGN19

*19-items; 5-point Likert Scale; Ranges → (1) "Strongly Disagree" to (5) "Strongly Agree"*

--Alignment with Learning Objectives

1. Each reading assignment and activity helped me succeed in meeting the expected outcome.
2. The work was busy work. (r)
3. The tools and media used were relevant to my achievement of the stated learning objectives.





4. Instructional materials contributed to the achievement of the course and module/unit objectives.
5. Instructions on how to meet the expected outcomes were adequate and stated clearly.

--Types of Learning Objectives

6. The course included problems to anchor course content to real life discipline practices.
7. The instructor helped me make connections between course materials and real world experiences.
8. The course had technologies and resources that supported my learning.
9. All resources and materials were appropriately cited throughout the course.
10. Course activities helped me understand fundamental concepts.
11. Course activities built relevant skills that were useful outside of the course.
12. Course learning objectives built upon prior knowledge obtained in other courses.

--Overall Organization of Course

13. The course was well-organized.
14. Course content was “chunked” or broken down into smaller parts for more manageable learning.
15. Course content was organized in a logical format.
16. Topics were clearly identified and subtopics were related to topics.
17. I understood the layout of course.
18. Navigation throughout the online components of the course was logical, consistent, and efficient.
19. The larger activities (group projects, research projects, portfolios, etc.) were broken down into parts with multiple deadlines or milestones to receive more feedback and encourage my completion.

Content Design and Delivery

Variable Names: ICCONTENT1 - ICCONTENT6

*6-items; 5-point Likert Scale; Ranges → (1) “Strongly Disagree” to (5) “Strongly Agree”*

1. The materials included short videos to explain harder-to-grasp concepts or processes.
2. The tools and media used were appropriate for the content being delivered.



3. Instructional materials have sufficient breadth, depth, and currency for me to learn the subject.
4. The materials included annotations to the texts assigned.
5. The materials included current online materials (online articles, webpages, links, and/or videos).
6. The materials included rich online materials, such as videos and images.

*Open-Ended Qualitative Questions*

Variable Names: ICCONTENTQ1

Q1. What practices can an instructor implement in order to help you succeed in an online or blended course?

Interactivity

Variable Names: IACTIVITY1 - IACTIVITY30

*30-items; 5-point Likert Scale; Ranges → (1) "Strongly Disagree" to (5) "Strongly Agree"*

--Instructor-Student

1. The instructor facilitated learning in the course.
2. The instructor effectively communicated ideas and information.
3. The instructor showed interest in my learning.
4. I received responses to my emails in a timely manner.
5. I received information on my instructor's availability (e.g., office hours) and turnaround time for email.
6. I received a welcome message before the class began through email or on the course site.
7. The instructor helped us understand the importance of course topics and how they were related to learning outcomes.
8. The instructor actively strived to keep course participants engaged and participating in productive dialogue.
9. The instructor encouraged us to explore new concepts throughout the course.
10. The instructor helped focus online discussions on relevant issues.
11. The feedback I received from the instructor was detailed and meaningful.



12. The instructor sent reminders of due dates and duration of respective modules, as well as other instructions to keep us on task.
13. The instructor explained their role regarding participation in online discussions.
14. The instructor participated and managed discussions, yet did not dominate them.
15. The instructor introduced us to new modules and lessons.
16. The instructor asked questions and provided new content to facilitate discussions.
17. The instructor provided summaries particularly at the end of topic, modules, or lessons.
18. I was prompted by my instructor to expand on relevant points.
19. Language of written material was friendly and supportive.

--Student-Student

20. There was an opportunity for me to connect with students on non-course related topics and be social.
21. I had the opportunity to introduce myself to others.
22. I completed an "Ice-breaker" activity or other orientation session to get acquainted with my peers
23. There were online debates to enhance classroom engagement.
24. The course fostered online collaborations.
25. Technological tools (e.g., chat) were used to enable me to connect with other students.
26. At the beginning of the course, I was provided an opportunity to introduce myself to others and develop the sense of community.
27. Learning activities encouraged me to interact with other students.
28. The discussions had an assigned leader to stimulate discussion among group members.
29. I participated in a group activity.
30. Learning activities facilitated and supported learning that was active, encouraging frequent and ongoing engagement with other students.

Assessment and Evaluation

Variable Names: ICASSESS1 - ICASSESS22

22-items; 5-point Likert Scale; Ranges → (1) "Strongly Disagree" to (5) "Strongly Agree"

--Expectations



1. The syllabus was easily located and included objectives, our expected outcomes, and completion requirements.
2. The objectives and outcomes of the course were clearly defined.
3. Activities were clearly defined.
4. There was opportunity for students to ask questions about what was expected of us.
5. Expectations of my participation (frequency and quality) were included in the syllabus or online.
6. I received detailed instructions and tips for completing assignments.
7. Samples of assignments illustrating expectations for my work were included.
8. The grading policy was stated clearly.
9. Expected student learning outcomes were specific, well-defined, and measurable.
10. I was provided ample opportunity to show what I learned in different ways.
11. Peer review opportunities were available.
12. Due dates for all assignments were provided.
13. I understood what was expected of me.
14. The assessment of my progress was effective.

--Grading

15. The method of grading my performance was clear.
16. A grading scale was provided.
17. Rubrics for assignments that identify guidelines were provided.
18. Criteria used to assess participation in discussions were shared.
19. My overall course grade was not based solely on exams and quizzes.
20. Graded assignments measured the stated learning objectives or outcomes and were consistent with the course.
21. Clear standards were set for the instructor's posting of grades, activities, and resources.
22. Graded assignments were appropriately timed within the length of the course, varied, and appropriate to the content being assessed.

*Open-Ended Qualitative Questions*

Variable Names: ICSTDTQ1-2

Q1. Think of a time in which you've taken an online/blended course. Explain an experience that influenced your success.



Q2. What are the necessary components of a successful online/blended course?

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## Student Behaviors and Perceptions

(Process or throughput)

STUDENT-LEVEL (self-reported behaviors)

### Course Activity Challenge

Variable Names: ACTCHAL1 - ACTCHAL17

*17-items; 5-point Likert scale; Ranges → (1) "Virtually None/Very Little" to (5) "Constant/Significant Amount"*

How much of each of the following tasks were required in your course?

1. Reading
2. Listening to audio
3. Watching videos
4. Examining slideshows
5. Taking notes
6. Utilizing websites
7. Taking quizzes
8. Taking exams
9. Writing short papers or responses
10. Writing academic papers or essays
11. Completing brief assignments
12. Completing major projects and assignments
13. Creating and delivering presentations
14. Completing group projects
15. Communicating with other students
16. Communicating with the instructor
17. Utilizing social media



### Interactivity

Variable Names: INTERACT1 - INTERACT16

16-items; 5-point Likert scale; Ranges → (1) "Never" to (5) "Very Often"

How often do you ...

1. Send email to your instructor
2. Receive emails from your instructor
3. Participate in class discussions
4. Read the instructor's posts on the discussion board
5. Read other students' posts on the discussion board
6. Post to the course discussion board
7. Read feedback on the course discussion board
8. Post questions about the course readings, lectures, or videos
9. Answer other students questions about course readings, lectures, or videos
10. Read course news or announcements
11. Post questions about the course procedures
12. Answer other students questions about course procedures
13. Participate in group activities
14. Discuss course topics or information with the instructor or other students using social media
15. Discuss course topics or information with the instructor or other students using web conferencing tools
16. Discuss course topics or information with the instructor or other students using tools outside of the course

### Active Learning Behaviors

Variable Names: ACTLEARN1 - ACTLEARN23

19-items; 5-point Likert scale; Ranges → (1) "Not at All" to (5) "Very Frequently"

How frequently did you ...

1. Generate questions from readings or lecture.
2. Reflect on readings or online materials (e.g., videos).



3. Ask the instructor questions.
4. Share information from completed readings or assignments.
5. Discuss ideas from the readings with other students in class.
6. Help explain course ideas or concepts to other students.
7. Conduct web or Internet research in class.
8. Work with other students on projects in class.
9. Ask a classmate a question.
10. Interact in pairs or threes.
11. Interact in small groups.
12. Take pictures of class work or projects.
13. Make a class presentation.
14. Discuss something without a single correct answer.
15. Complete case studies.
16. Critique classmates' assignments.
17. Use a variety of digital media (e.g., video, audio, images).
18. Play games or interactive activities.
19. Complete simulations.

#### INSTRUCTOR-LEVEL (student report)

How frequently did your instructor,

20. Require students to solve a real-world problem.
21. Require students to analyze scenarios or case studies.
22. Require students to complete a simulation or role-play.
23. Require students to use special software or applications relevant to the course.

\*Note, additional student perceptions of instructor-level behaviors are included in the instructional characteristics instrument.



COURSE-LEVEL (student perceptions)

Communication Richness

Variable Names: COMRICH1 - COMRICH11

*12-items; 5-point Likert scale; Ranges → (1) “Strongly Disagree” to (5) “Strongly Agree”*

1. I was able to receive feedback from others right away.
2. I was able to transmit a variety of different cues beyond the explicit message (e.g., nonverbal cues, environmental cues).
3. I was able to tailor messages to my own personal circumstances.
4. I was able to use rich and varied language.
5. I was able to convey multiple types of information (verbal and nonverbal).
6. I was able to transmit varied symbols (e.g., words, gestures, images).
7. I was able to design messages to meet my own requirements.
8. It was difficult to get my point across when communicating. (r)
9. I could only to communicate basic messages. (r)
10. I couldn't understand what other people were trying to communicate to me. (r)
11. I was unable to communicate nonverbally. (r)

Social Presence (immediacy and intimacy)

Variable Names: SOCPRES1 - SOCPRES15

*15-items; 5-point Likert scale; Ranges → (1) “Strongly Disagree” to (5) “Strongly Agree”*

1. I felt as if I was communicating with a real person.
2. I felt as if I was communicating with another human being.
3. I was able to be expressive.
4. I was able to develop a closeness with others.
5. I had immediate responses to my comments and questions.
6. I was comfortable interacting with other participants.
7. I was able to form distinct individual impressions of others.
8. I was unable to express myself. (r)
9. It was difficult to receive feedback from others. (r)





10. I did not feel connected to others. (r)
11. I was not able to develop a closeness with others. (r)
12. I didn't receive responses to my comments or questions right away. (r)
13. I was not comfortable interacting. (r)
14. I was not able to form impressions of others. (r)
15. I didn't feel like I was communicating with a real person. (r)

### Presence

Newly developed (See Appendix B)

Variable Names: PRESENCE1 - PRESENCE20

*20-items; 5-point Likert scale; Ranges → (1) "Strongly Disagree" to (5) "Strongly Agree"*

1. While taking an online course, my course interactions with others made me feel validated.
2. While taking an online course, I felt that my instructor was open to changing the course environment.
3. While taking an online course, I had the opportunity to practice what I learned in a realistic context.
4. While taking an online course, the course interactive activities allowed me to engage and learn from others.
5. While taking an online course, I felt that my class or group members and I were physically together in the same location.
6. While taking an online course, my course communications with the instructors made me feel acknowledged.
7. While taking an online course, I felt that my instructor utilized technologies, assignments, and activities that appealed to different learning styles.
8. While taking an online course, I felt that the online environment was almost like the physical face-to-face class.
9. The course was so immersive that I was able to ignore my physical environment.
10. While taking an online course, I felt that my instructor and I were physically together in the same location.



11. While taking an online course, in my mind I felt highly involved with my class or group members.
12. While taking an online course, I felt recognized in the class or group interactions.
13. While taking an online course, I felt my instructor was open to feedback about the course environment.
14. While taking an online course, the interactive activities made me feel that the line between the real and the virtual world was blurred.
15. While taking an online course, I felt technology seemed nonexistent.
  
16. While taking an online course, I had the illusion of being in another location as my mind interacted with the content.
17. While taking an online course, the online activities connected me with others.
18. While taking an online course, utilizing avatars allowed me to interact and learn from others.
19. While taking an online course, my interaction with others was so lively that the technology seemed to disappear.
20. I intentionally ignored the physical environment and immersed myself in the online course.

### Learning Community

Variable Names: LRNCOMM1 - LEARNCOMM9

9-items; 5-point Likert scale; Ranges → (1) "Strongly Disagree" to (5) "Strongly Agree"

1. I created social networks.
2. I developed personal relationships with my classmates.
3. I developed a personal relationship with my instructor.
4. I was able to communicate sufficiently with others.
5. The learning activities encouraged contact between myself and my classmates.
6. My classmates and I cooperated in completing assignments.
7. I did not develop relationships with my classmates. (r)
8. There was little opportunity for me to communicate with my classmates. (r)
9. There was little cooperation in completing assignments with my classmates. (r)



Engagement (academic challenge)

Variable Names: ENGAGE1 - ENGAGE21

21-items; 5-point Likert scale; Ranges → (1) “Strongly Disagree” to (5) “Strongly Agree”

1. The learning activities were academically challenging.
2. The learning activities required me to think critically.
3. I was engaged in the learning experiences.
4. I was captivated.
5. I felt wrapped up in the experience.
6. I was absorbed in the experience.
7. I was attracted to the learning activities.
8. The class was an enriching experience.
9. The learning experiences were active and collaborative.
10. Class was fun and exciting.
11. I was willing to put in the effort needed to complete the learning activities.
12. The class kept me totally absorbed in the activity.
13. The class held my attention.
14. The class excited my curiosity.
15. The class aroused my imagination.
16. The class activities were not challenging. (r)
17. The class activities required little thought. (r)
18. The class was boring. (r)
19. I was not engaged in the learning activities. (r)
20. The activities were not active. (r)
21. The class was a waste of time. (r)

Program and External Support

Variable Names: LRNSUPP\_F1 - LRNSUPP\_F13

13-items; 5-point Likert scale; Ranges → (1) “Not at all” to (5) “Very Frequently”

How frequently did you receive support from the following and how helpful was it?



1. Campus Tutoring
2. Program Tutoring
3. Campus Library
4. Campus Technology Help Desk
5. Program Tech Help
6. Third-party Technology Company
7. Advisor
8. Classmates
9. Friends
10. Family
11. Class instructor
12. Other instructor
13. Other-name

Variable Names: LRNSUPP\_H1 - LRNSUPP\_H13

*13-items; 5-point Likert scale; Ranges → (1) “Not helpful at all” to (5) “Very Helpful”*

How helpful did you find the support from the following?

1. Campus Tutoring
2. Program Tutoring
3. Campus Library
4. Campus Technology Help Desk
5. Program Tech Help
6. Third-party Technology Company
7. Advisor
8. Classmates
9. Friends
10. Family
11. Class instructor
12. Other instructor
13. Other-name



*Open-Ended Qualitative Questions*

Variable Names: LRNSUPPQ1 - LEARNSUPPQ2

Q1. Where do you most often find support for your blended or online classes that is most useful? Please describe in some detail.

Q2. In what support services would you recommend an institution or program invest resources to better serve you as a student taking blended or online courses? Why?

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Student Outcomes

Performance

Variable Names:PERFORM1 - PERFORM

*5-items; 5-point Likert scale; Ranges → (1) "Strongly Disagree" to (5) "Strongly Agree"*

1. The class activities helped me get a better grade.
2. My experience in the course helped me do better on my exams and other assignments.
3. The class activities did not help me score higher on the exams.
4. I got higher scores on my assignments because of my experience in the course.
5. The class activities did not improve my assignment grades.

*Open-Ended Qualitative Question*

Variable Names: PERFORMQ1

Q1. How would you classify your performance in this course (i.e., grades)?

Expected Grade

Variable Name: EXPGRD

What final grade do you expect to receive in this class?

A

A-/B+

B

B-/C+

C



C-/D+

D

D-/F+

F

### Learning

Variable Names: LEARN1 - LEARN10

*10-items; 5-point Likert scale; Ranges → (1) "Strongly Disagree" to (5) "Strongly Agree"*

1. The class allowed me to better understand concepts.
2. The class did not help me to understand concepts better. (r)
3. The class helped me understand the course material.
4. The class made it easy to connect ideas together.
5. The class helped me think more deeply about course material.
6. The class did not help my learning. (r)
7. The class did not make it easier for me to understand the course material. (r)
8. I was not able to better understand course concepts. (r)
9. The class was beneficial to my learning.
10. The class had little impact on my learning. (r)

### Satisfaction

Variable Names: SATIS1 - SATIS13

*13-items; 5-point Likert scale; Ranges → (1) "Strongly Disagree" to (5) "Strongly Agree"*

1. I would take another online course.
2. I would recommend that the instructor continue teaching this course online.
3. I liked this course delivered online.
4. I would not recommend this course to a friend. (r)
5. Participating in this online course was a useful experience.
6. It was difficult to access the online course. (r)
7. Getting online to access the course was easy.
8. Technical support was available when I needed it.



9. I needed better technical support. (r)
10. I had little problems in the online environment.
11. I sometimes had difficulty online. (r)
12. I would avoid classes that are online in the future. (r)
13. I would not recommend this course to a friend. (r)

Success (Exploratory)

*Open-Ended Qualitative Questions*

Variable Names: SUCCESQ1 - SUCCESQ4

- Q1. What strategies did you use to help yourself succeed in the online course?
- Q2. What strategies would you recommend to another student taking an online course about how to be successful?
- Q3. What does it mean to you to be a successful student?
- Q4. Beyond grades and earning credits, what else is helpful for identifying your degree of success?

Data

Codebooks



# Institutionally Warehoused Data



List of Institutionally Warehoused Data - Variables, Measure, Definitions, and Coding

*\*Note: The codebook will be revised based on feasibility determined during data collection. Institutionally warehouse data will be merged with experimental and survey measures.*

VariableID	MeasureID	Definition	Label	Coding
Student and Learner Characteristics				
Gender	Gender	Male/female/unknown (transgender collapsed into "unknown" due to low numbers)	IGEN	Match to IPEDS  1=Male 2=Female 99=Unkown
Age	Birthday	month and year of birth	IAGE	Numerical age (after calculating based on birthday)  Match to FAFSA  Numerical age (after calculating based on birthday, xx/xx/xxxx matching FAFSA)
Ethnicity	Ethnicity	Hispanic/Not Hispanic/Unknown	IETH	Not Hispanic = 0 Hispanic = 1 Unknown = 99
Race	Race	based on IPEDS2 classification	IRACE	Match to IPEDS  1 = American Indian or Alaska Native 2 = Asian 3 = Black or African American

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				4 = Native Hawaiian or Other Pacific Islander 5 = White 6 = Two or more races 99 = Unknown
First Generation	Mother , Parent 1 Education Level	mother's or parent 1 highest level of education achieve	IMEDUC	1=Middle school/Jr. high 2=High school 3=College or beyond 99=Other/unknown  match to FAFSA
	Father, Parent 2 Education Level	father's or parent 2 highest level of education achieve	IFEDUC	1=Middle school/Jr. high 2=High school 3=College or beyond 99=Other/unknown  match to FAFSA
Income	Family Income	household income student was raised in	IFAMINC	continuous, match to FAFSA
	Student Income	student's current income	ISTUINC	continuous, match to FAFSA
	Pell Grant Eligible		IPGE	Yes = 1 No = 2 Unknown = 99  *possibly match to SIS
	Orphan	orphan or foster status/independent	IORPHAN	match to SIS, FAFSA coding

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				Yes=1 No=2 Unknown=99
	Marital status	marital status	IMARSTAT	match to SIS, FAFSA coding  I am single = 1 I am married = 2 I am separated = 3 I am divorced or widowed=4
Prior academic achievement	Current overall GPA	student overall or cumulative GPA	IOVERGPA	continuous or don't know  *possibly match to SIS
	Class rank	student class rank	ICLASSRNK	continuous or don't know  *possibly match to SIS
	Current major GPA	student GPA within their major	IMAJORGPA	continuous or don't know  *possibly match to SIS
Degree completion progress	Credits towards or percentage of degree completed	student progress toward degree completion	IDEGPROG	continuous

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Native English speaker	Native English speaker	English as the student's first language	IENGLISH	1 = Yes 0 = No  *possibly match to SIS
Disability	Physical disability	Physical Disability	IPHYSDIS	1 = Yes 0 = No  *possibly match to SIS
Course Characteristics				
Course level	Course level	Freshman through Graduate level course	ICRSLEVE	Freshman = 1 Sophomore = 2 Junior = 3 Senior = 4 Graduate = 5
Mode	Face-to-face, Blended, Online	F2F, blended, online	ICRSMODE	Face-to-face = 0 Online = 1 Blended = 2
Student Outcomes				
Final course grade		includes incompletes, W, pass/fail, audits. Excludes penalty fee drops	IGRD_FIN	Coding provided by individual institutions
Course Completion		Passing grade in a course	ICOMP	0=no 1=yes
Success		Student received a C or better in the course	ISUCC	0 = no 1 = yes



Resources:

Integrated Postsecondary Education Data System

<https://nces.ed.gov/ipeds/>

Predictive Analytics Reporting (PAR) Framework

<http://www.parframework.org/>



# Student Survey Data



List of Student Survey Data - Variables, Measure, Definitions, and Coding.

*\*Note: The codebook will be revised based on feasibility determined during data collection. Survey data will be merged with institutionally warehoused data and possibly experimental where applicable.*

## List of Student Survey Variables, Measures, Definitions, Coding, and Associated Instrumentation

Variable ID	Measure ID	Definition	Label	Coding
Student and Learner Characteristics				
Demographics				
Gender	Gender	student gender to which they identify  note:IPEDS refers to as biological sex	GEN	Match to IPEDS  1=Male 2=Female 99=Unknown
Age	Age	student age, numerical	AGE	Match to FAFSA  Numerical age (after calculating based on birthday, xx/xx/xxxx matching FAFSA)

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Ethnicity	Ethnicity	student reported ethnicity	ETH	0 = Non-Hispanic 1 = Hispanic 99 = Unknown
Race	Race	student reported race	RACE	Match to IPEDS  1 = American Indian or Alaska Native 2 = Asian 3 = Black or African American 4 = Native Hawaiian or Other Pacific Islander 5 = White 6 = Two or more races 99 = Unknown
First Generation	Mother , Parent 1 Education Level	student report of mother's highest level of education achieve	MEDUC	1=Middle school/Jr. high 2=High school 3=College or beyond 99=Other/unknown  match to FAFSA
	Father, Parent 2 Education Level	student report of father's highest level of education achieve	FEDUC	1=Middle school/Jr. high 2=High school 3=College or beyond 99=Other/unknown  match to FAFSA

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Income	Family Income	household income student was raised in	FAMINC	continuous, match to FAFSA
	Student Income	student's current income	STUINC	continuous, match to FAFSA
	Pell Grant Eligible		PGE	Yes = 1 No = 2 Unknown = 99  *possibly match to SIS
	Orphan	self-report of orphan status, parents deceased	ORPHAN	match to SIS, FAFSA coding  Yes=1 No=2 Unknown=99
	Marital status	self-report of marital status	MARSTAT	match to SIS, FAFSA coding  I am single=1 I am married=2 I am separated=3 I am divorced or widowed=4
Grade Level	Year in school	self-report of student grade level	GRDLVL	*see item



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Time Commitment	Paid Work Hours	self-reported hours worked/week	WRKHRS	continuous (hours worked last week), don't know or none
	Employment Type	self-reported employment status	EMPSTAT	1= Unemployed, not looking for work 2=Unemployed, looking for work 3=Part time 4=Full time 99=Unkown  *possibly match to SIS
	Student Type	self-reported student status	STUTYPE	1=Part time 2=Full time 3=Overload 99=Unknown  *possibly match to SIS
	Credit Hours	self-reported number of credits	CDTHRS	Continuous (number of credits enrolled last semester) or don't know
Functional impairment	Cognitive	self-reported cognitive impairment	IMPCOGN1 - IMPCOGN12	<ul style="list-style-type: none"> <li>• 12 items</li> <li>• Yes/No Responses</li> <li>• 0 reverse coded</li> </ul>
	Sensory	self-reported sensory impairment	IMPSENS1 - IMPSENS3	<ul style="list-style-type: none"> <li>• 3 items</li> <li>• Yes/No Responses</li> </ul>

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				<ul style="list-style-type: none"> <li>• 0 reverse coded</li> </ul>
	Behavioral	self-reported behavioral impairment	IMPBEHV1 - IMPBEHV9	<ul style="list-style-type: none"> <li>• 9 items</li> <li>• Yes/No Responses</li> <li>• 0 reverse coded</li> </ul>
	Motor	self-reported motor impairment	IMPMOTOR1 - IMPMOTOR4	<ul style="list-style-type: none"> <li>• 4 items</li> <li>• Yes/No Responses</li> <li>• 0 reverse coded</li> </ul>
Assistive technology	Communication Aid	self-reported use of communication or hearing and listening aid	ATCOMM1 - ATCOMM20	<ul style="list-style-type: none"> <li>• 20 items</li> <li>• Yes/No Responses</li> <li>• 0 reverse coded</li> </ul>
	Computer Access Aid	self-reported use of computer access aid	ATCOMP1 - ATCOMP22	<ul style="list-style-type: none"> <li>• 22 items</li> <li>• Yes/No Responses</li> <li>• 0 reverse coded</li> </ul>
	Mobility Aid	self-reported use of transportation aid, prosthetics or orthotics, or mobility aid	ATMOBIL1 - ATMOBIL5	<ul style="list-style-type: none"> <li>• 5 items</li> <li>• Yes/No Responses</li> <li>• 0 reverse coded</li> </ul>
	Other Modification	self-reported use of personal aide,	ATOTH1 - ATOTH5	<ul style="list-style-type: none"> <li>• 5 items</li> <li>• Yes/No Responses</li> </ul>

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		interpreter, or tutor		<ul style="list-style-type: none"> <li>0 reverse coded</li> </ul>
Prior academic achievement	Current overall GPA	self-reported student overall or cumulative GPA	OVERGPA	<p>continuous or don't know</p> <p>*possibly match to SIS</p>
	Class rank	self-reported student class rank, if known	CLASSRNK	<p>continuous or don't know</p> <p>*possibly match to SIS</p>
	Current major GPA	self-reported student GPA within their major	MAJORGPA	<p>continuous or don't know</p> <p>*possibly match to SIS</p>
Degree completion progress	Credits towards or percentage of degree completed	self-reported student progress toward degree completion	DEGPROG1-2	<ul style="list-style-type: none"> <li>2 items</li> <li>1 = 0-25%; 2 = 26-50%; 3 = 51-75%; 76-99%; 100%</li> <li>DEGPROG2 continuous or don't know</li> </ul>
Native English speaker	Native English speaker	self-reported as English as the student's first language	ENGLISH	<p>1 = Yes</p> <p>0 = No</p> <p>*possibly match to SIS</p>

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Disability	Physical disability	self-reported physical disability	PHYSDIS	1 = Yes 0 = No  *possibly match to SIS
	Learning disability	self-reported learning disability	LRNDIS	1 = Yes 0 = No  *possibly match to SIS
	Mental illness	self-reported mental illness	MENILL	1 = Yes 0 = No
Preparedness and Readiness				
Experience in Distance Education	Experience in Distance Education	student's self-reported enrollment and previous experience in distance education courses	PREPDEEXP1 - PREPDEEXP2	<ul style="list-style-type: none"> <li>• 2 items</li> <li>• continuous or unknown</li> </ul>
Preparedness and Readiness	Access to technology and environment	student's self-reported preparedness or readiness for distance education based on access to technology and	PREPTECH1 - PREPTECH3	<ul style="list-style-type: none"> <li>• 3 items</li> <li>• Yes/No Response</li> <li>• 0 = No; 1 = Yes; 99 = Don't Know</li> </ul>



		study environment		
	Online skill proficiency	student's self-reported preparedness or readiness for distance education based on one's beliefs about their skills proficiency, comfort with technology, or experience with technology - sometimes referred to as self-efficacy using technology or technology use	PREPSKILLS_A1 - PREPSKILLS_A16	<ul style="list-style-type: none"> <li>• 67 items</li> <li>• 5-point likert scale</li> <li>• "Strongly Disagree" to "Strongly Agree"</li> <li>• 0 reverse coded</li> </ul>
	Technology familiarity	student's self-reported preparedness or readiness for distance education based on one's beliefs about their familiarity with	PREPFAM1 - PREPFAM11	<ul style="list-style-type: none"> <li>• 11 items</li> <li>• 5-point likert scale</li> <li>• "Very Frequently" to "Never"</li> <li>• 0 reverse coded</li> </ul>

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		technology in general		
	Organization	student's self-reported preparedness or readiness for distance education based on one's beliefs about the importance of organization or their ability to be organized.	PREPORG1 - PREPORG5	<ul style="list-style-type: none"> <li>• 5 items</li> <li>• 5-point likert scale</li> <li>• "Strongly Disagree" to "Strongly Agree"</li> <li>• 1 reverse coded (PREPORG5)</li> </ul>
	Online learning efficacy	student's self-reported beliefs about online learning	PREPSE1- PREPSE7	<ul style="list-style-type: none"> <li>• 7 items</li> <li>• 5-point likert scale</li> <li>• "Strongly Disagree" to "Strongly Agree"</li> <li>• 0 reverse coded</li> </ul>
	Self-directedness	student's self-reported belief about their initiative and ability to be self-directed	PREPSD1- PREPSD15	<ul style="list-style-type: none"> <li>• 15 items</li> <li>• 5-point likert scale</li> <li>• "Strongly Disagree" to "Strongly Agree"</li> <li>• 0 reverse coded</li> </ul>

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	Experimentation and growth	student's self-reported belief about their ability to experiment, take risks, or grow/change - sometimes referred to as risk-taking or growth mindset	PREPGROW1- PREPGROW17	<ul style="list-style-type: none"> <li>• 17 items</li> <li>• 5-point likert scale</li> <li>• "Strongly Disagree" to "Strongly Agree"</li> <li>• 4 reverse coded (PREPGROW6, PREPGROW7, PREPGROW9, PREPGROW11)</li> </ul>
	Achievement	student's self-reported belief of one's ability to achieve	PREPACH1- PREPACH21	<ul style="list-style-type: none"> <li>• 21 items</li> <li>• 5-point likert scale</li> <li>• "Strongly Disagree" to "Strongly Agree"</li> <li>• 2 reverse coded (PREPACH1 &amp; PREPACH2)</li> </ul>
	Socialization	student's self-reported desire or need to socialize and interact	PREPSOC1- PREPSOC14	<ul style="list-style-type: none"> <li>• 14 items</li> <li>• 5-point likert scale</li> <li>• "Strongly Disagree" to "Strongly Agree"</li> </ul>



				<ul style="list-style-type: none"> <li>• 1 reverse coded (PRPSOC11)</li> </ul>
	Enrollment motivation	student's self-reported motivation to enroll in a course due to the content, mode, or goals	PREPENRL1- PREPENRL31  and PREPENRLQ1 - PREPENRLQ2	<ul style="list-style-type: none"> <li>• 31 items</li> <li>• 5-point likert scale</li> <li>• "Strongly Disagree" to "Strongly Agree"</li> <li>• 1 reverse coded (PREPENRL31)</li> </ul> and <ul style="list-style-type: none"> <li>• 2 qualitative</li> <li>• open-ended questions</li> </ul>
Course Characteristics				
Course Level	Course Level	Student self-report of course level	CRSLEVEL	1 = undergraduate 100-200 level (general education course) 2 = undergraduate 300 level or greater (course within major) 3 = undergraduate 100-200 elective 4 = undergraduate 300 level or greater elective 5 = graduate course



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Course Department	Course Department	Student self-report of department course is in	CRSDEPT	<dropdown list from Registrar>
Course Mode	Course Mode	Student self-report of course mode	CRSMODE	1 = F2F 2 = Blended/Hybrid 3 = Online 4 = Other, describe.
Course/Program Design	Course Design	Optional Student self-report of course design	CRSDSIGN	1= Competency-based education 2 = Self-paced (e.g., U-Paced) 3 = Traditional, not specially designed course or program 99 = Unknown
Course Content/Topic	Course content or topic	Student self-report of course topic or content	CRSTOPIC	Text entry Recode by discipline?
Course in plan of study for major	Course within student plan of study or major requirements	Student self-report of whether course is related to major	CRSMAJOR	1= GER, required for degree 2 = Required for major 3 = Elective, not required for major
Instructional Characteristics				
Instructional characteristics	Learner support	Student report of perceptions	ICLEARNS1 - ICLEARNS29	<ul style="list-style-type: none"> <li>29 items</li> </ul>

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		of learner support, including course materials and guides to support	and ICLEARNSQ1 - ICLEARNSQ2	<ul style="list-style-type: none"> <li>• 5-point likert scale</li> <li>• “Strongly Disagree” to “Strongly Agree”</li> <li>• 0 reverse coded</li> </ul> and <ul style="list-style-type: none"> <li>• 2 qualitative open-ended questions</li> </ul>
	Design and organization	Student report of perceptions of course design and organization	ICDESIGN1 - ICDESIGN19	<ul style="list-style-type: none"> <li>• 19 items</li> <li>• 5-point likert scale</li> <li>• “Strongly Disagree” to “Strongly Agree”</li> <li>• 1 reverse coded (ICDESIGN2)</li> </ul>
	Content design and delivery	Student report of perceptions of the course content and how it is delivered to students (student interaction with content)	ICCONTENT1 - ICCONTENT6  and ICCONTENTQ 1	<ul style="list-style-type: none"> <li>• 6 items</li> <li>• 5-point likert scale</li> <li>• “Strongly Disagree” to “Strongly Agree”</li> <li>• 0 reverse coded</li> </ul> and



				<ul style="list-style-type: none"> <li>• 1 qualitative open-ended question</li> </ul>
	Interactivity	Student report of perceptions of course interactivity with other students and the instructor	ICACTIVITY1 - ICACTIVITY30	<ul style="list-style-type: none"> <li>• 30 items</li> <li>• 5-point likert scale</li> <li>• “Strongly Disagree” to “Strongly Agree”</li> <li>• 0 reverse coded</li> </ul>
	Assessment and evaluation	Student report of perceptions of assessments and evaluation	ICASSESS1 - ICASSESS22	<ul style="list-style-type: none"> <li>• 22 items</li> <li>• 5-point likert scale</li> <li>• “Strongly Disagree” to “Strongly Agree”</li> <li>• 0 reverse coded</li> </ul>
			ICSTDTQ1-2	<ul style="list-style-type: none"> <li>• 2 qualitative open-ended question</li> </ul>
Student Behaviors and Perceptions				
Course Activity Challenge	Course Activity Challenge	student’s self-reported challenge of course activity completion and composition	ACTCHAL1 - ACTCHAL17	<ul style="list-style-type: none"> <li>• 17 items</li> <li>• 5-point likert scale</li> <li>• “Virtually non/Very Little” to</li> </ul>

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				<p>“Constant/Significant Amount”</p> <ul style="list-style-type: none"> <li>• 0 reverse coded</li> </ul>
Interactivity	Interactivity	student’s self-reported communication behaviors interacting with the instructor or other students	INTERACT1-INTERACT16	<ul style="list-style-type: none"> <li>• 16 items</li> <li>• 5-point likert scale</li> <li>• “Never” to “Very Often”</li> <li>• 0 reverse coded</li> </ul>
Learning activity	Learning (passive or active)	self-reported student learning behaviors and perceptions of instructor behaviors	ACTLEARN1 - ACTLEARN23	<ul style="list-style-type: none"> <li>• 23 items</li> <li>• 5-point likert scale</li> <li>• “Not at all” to “Very Frequently”</li> </ul>
Media richness	Richness of communication media	self-reported media richness and course communication	COMRICH1-COMRICH11	<ul style="list-style-type: none"> <li>• 11 items</li> <li>• 5-point likert scale</li> <li>• “Strongly Disagree” to “Strongly Agree”</li> <li>• 4 reverse coded (COMRICH8-COMRICH11)</li> </ul>
Social Presence	Social Presence	student’s self-reported	SOCPRES1-SOCPRES15	<ul style="list-style-type: none"> <li>• 15 items</li> </ul>

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		feelings of social presence (intimacy and immediacy) with course, peers, and instructor from Short et al 1976 social presence theory		<ul style="list-style-type: none"> <li>• 5-point likert scale</li> <li>• “Strongly Disagree” to “Strongly Agree”</li> <li>• 8 reverse coded (SOCPRES8-SOCPRES15)</li> </ul>
Presence	Presence	student’s perception of being there from Being There for the Online Learner Model (Lehman & Conceição, 2010)	PRESENCE1-PRESENCE20	<ul style="list-style-type: none"> <li>• 20 items</li> <li>• 5-point likert scale</li> <li>• “Strongly Disagree” to “Strongly Agree”</li> <li>• 0 reverse coded</li> </ul>
Learning Community	Learning community	self-reported perceptions of learning community	LRNCOMM1-LRNCOMM9	<ul style="list-style-type: none"> <li>• 9 items</li> <li>• 5-point likert scale</li> <li>• “Strongly Disagree” to “Strongly Agree”</li> <li>• 3 reverse coded (LRNCOMM7-LRNCOMM9)</li> </ul>

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Engagement	Engagement	self-reported engagement with academic challenges, active/collaborative activities, and course community	ENGAGE1-ENGAGE21	<ul style="list-style-type: none"> <li>• 21 items</li> <li>• 5-point likert scale</li> <li>• “Strongly Disagree” to “Strongly Agree”</li> <li>• 6 reverse coded (ENGAGE16-ENGAGE21)</li> </ul>
Program and external support	Program and External Support	self-reported frequency and usefulness of support received from the institution, program, or external mechanisms	<p>LRNSUPP_F1 - LRNSUPP_F13</p> <p>LRNSUPP_H1 - LRNSUPP_H13</p> <p>and</p> <p>LRNSUPPQ1 - LRNSUPPQ2</p>	<ul style="list-style-type: none"> <li>• 13 items</li> <li>• 5-point likert scale</li> <li>• “Never” to “Very Frequently”</li> <li>• 0 reverse coded</li> </ul> <p>and</p> <ul style="list-style-type: none"> <li>• 31 items</li> <li>• 5-point likert scale</li> <li>• “Not helpful at all” to “Very Helpful”</li> <li>• 0 reverse coded</li> </ul> <p>and</p> <ul style="list-style-type: none"> <li>• 2 qualitative open-ended question</li> </ul>



Student Outcomes				
Performance	Perception of performance	student's self-reported perceptions of performance on assessments and overall in course	PERFORM1 - PERFORM5  and PERFORMQ1	<ul style="list-style-type: none"> <li>• 5 items</li> <li>• 5-point likert scale</li> <li>• "Strongly Disagree" to "Strongly Agree"</li> <li>• 5 reverse coded (PERFORM5)</li> </ul> and <ul style="list-style-type: none"> <li>• 1 qualitative open-ended question</li> </ul>
	Expected grade	student's self-reported belief of their grade earned	EXPGRD	<ul style="list-style-type: none"> <li>• 1 = A; 2 = A-/B+; 3 = B; 4 = B-/C+; 5 = C; 6 = C-/D=; 7 = D; 8 = D-/F+; 9 = F</li> <li>• 99 = Don't Know</li> </ul>
Learning	Perception of learning	student's self-reported perceptions of learning	LEARN1 - LEARN10	<ul style="list-style-type: none"> <li>• 10 items</li> <li>• 5-point likert scale</li> <li>• "Strongly Disagree" to "Strongly Agree"</li> <li>• 5 reverse coded (LEARN2, LEARN6-</li> </ul>

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				LEARN8, LEARN10)
Satisfaction	Satisfaction	student's self-reported satisfaction with course	SATIS1 - SATIS13	<ul style="list-style-type: none"> <li>• 13 items</li> <li>• 5-point likert scale</li> <li>• "Strongly Disagree" to "Strongly Agree"</li> <li>• 6 reverse coded (SATIS4, SATIS6, SATIS9, SATIS11 - SATIS13)</li> </ul>
Success	Success	student's self-report of definition of success and strategies success	SUCCESQ1 - Q4	<ul style="list-style-type: none"> <li>• 4 qualitative open-ended questions</li> </ul>

*\*Note: See Data Collection section for more on survey development and references to surveys included in this packet.*



# Supplemental Materials

# Human Subjects Requirements



This document provides background on the human subject review process and pertinent information to obtaining IRB approval.

## A Guide to IRB

1. DETA exempt human subjects narrative and overview
2. Waived informed consent
3. Sample waiver informed consent
4. Sample data sharing agreement

*Note: The DETA Research Center has IRB approval and can facilitate approval of your study. There may not be a need for additional IRB approvals at your institution depending on your proposed study. The waiver of informed consent will be administered through the DETA Research Center survey and survey tool to participating institutions funded through the DETA grant awards. Other individuals and institutions may be included. Therefore, these materials may be informative and not require action. Each institution will most likely require a data sharing agreement for data submitted to the DETA Research Center for cross-institutional analysis.*

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## Exempt Human Subjects Narrative

### **A. Human Subjects Involvement and Characteristics**

Participation may involve:

1. Institutional partners in data mining studies, including data mining of student information system demographic and performance data
2. Institutional partners in survey studies, including student response data
3. Institutional partners in experimental studies where students will be randomly assigned into an experimental condition experiencing an instructional intervention or a comparison condition



### ***B. Sources of Materials***

Information gathered during data mining projects specifically for research purposes include historical data mined from the student information system for courses delivered blended or online including student demographic information, race/ethnicity, Pell grant eligibility, first generation status, cumulative GPA, composite ACT score or SAT equivalent, overall course grade, etc..

Information gathered during survey research projects will include student survey responses including student demographic information, student perceptions of course and instructional characteristics, and student self-report of student outcomes, such as learning, performance, and satisfaction.

Information gathered during experimental research projects may include scores on any summative and formative assessments measuring learning

### ***C. Recruitment and Informed Consent***

For the data mining studies, data sets will be obtained through data mining and not direct interaction with human subjects. Data sharing agreements between UWM and the other institutions will be in place. The research involves the collection and study of existing data and will be recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. A waiver of consent will be obtained.

For the student survey and experimental studies, instructors and their courses will be identified through sub-grant award institutions opting to participate in the study. The students associated with these classes or courses will be participating at sub-grant awardee locations. The research conducted will be in established and commonly accepted educational settings, involving normal educational practices. A waiver of consent will be obtained.

### ***D. Potential Risks and Protections***

#### *Risks to Confidentiality*

This risk is unlikely given that all information gathered will be treated under the Human Subjects Review Board guidelines of confidentiality of research participant records. A unique code assigned to each participating student (rather than his/her name) will be used to link data



mined, such as a particular student's demographic information, the student's performance variables, and the student's assessment data. Instructors will be assigned a unique code as well. Survey data from students and instructors will be anonymous and coded. Also, it will be used if he/she is randomly selected and chooses to participate in the experimental studies.

### *E. Importance of the Knowledge to be Gained*

The project will enhance our ability to conduct cross-institutional research and advance evidence-based practice in distance education and online learning ensuring student success through quality learning experiences.

### *F. Collaborating Site(s)*

Milwaukee Area Technical College, University of Wisconsin-Extension, and sub-grant awardees.

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## Waiver of Requirement for Signed Form

An IRB may waive the requirement for the investigator to obtain a signed consent form for some or all subjects, if it finds either:

1. That the only record linking the subject and the research would be the consent document, and the **principal risk** would be potential harm resulting from a breach of confidentiality. Each subject will be asked whether the subject wants documentation linking the subject with the research, and the subject's wishes will govern; or
2. That the research presents **no more than minimal risk** of harm to subjects, and involves no procedures, for which written consent is normally required outside of the research context.

*Survey collections of data from students typically meet this standard and are given waiver for a written consent. In such cases, a statement should be included on the consent form indicating that by continuing the survey, the student consents to participation.*



In cases in which the documentation requirement is waived, the IRB may require the investigator to provide subjects with a written statement regarding the research.

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## Sample Waiver of Informed Consent

This waiver should be included at the beginning of a survey prior to the student starting the survey:

### **University of Wisconsin – Milwaukee**

#### **Consent to Participate in Online Survey Research**

**Study Title:** Ensuring student success and access in distance education

**Person(s) Responsible for Research:** Tanya Joosten, Academic Affairs, UW-Milwaukee

**Study Description:** The purpose of this research study is to investigate student success in blended and online courses at UW-Milwaukee. This pilot project includes approximately xx instructors and xxx students in the overall sample. If you agree to participate, you will be asked to complete an online survey that will take approximately 30 minutes to complete. The questions will ask you about your experiences in your blended or online course.

**Risks / Benefits:** Risks to participants are considered minimal. Collection of data and survey responses using the internet involves the same risks that a person would encounter in everyday use of the internet, such as breach of confidentiality. While the researchers have taken every reasonable step to protect your confidentiality, there is always the possibility of interception or hacking of the data by third parties that is not under the control of the research team.

There will be no costs for participating. Benefits of participating include furthering knowledge about blended and online learning.

**Confidentiality:** Your student ID is collected online to match data files. Data will be retained on the Qualtrics website server for two (2) years and will be deleted after this time. However, data may exist on backups or server logs beyond the timeframe of this research project. Data



transferred from the survey site will be saved in an encrypted format for up to ten (10) years. Only the Principal Investigators and project staff will have access to the data collected by this study. However, the Institutional Review Board at UW-Milwaukee or appropriate federal agencies like the Office for Human Research Protections may review this study's records. The research team will remove any individual identifying information before analyzing the data and all study results will be reported without identifying information so that no one viewing the results will ever be able to match you with your responses.

**Voluntary Participation:** Your participation in this study is voluntary. You may choose to not answer any of the questions or withdraw from this study at any time without penalty. Your decision will not change any present or future relationship with the University of Wisconsin-Milwaukee.

Who do I contact for questions about the study: For more information about the study or study procedures, contact XX at XX.

Who do I contact for questions about my rights or complaints towards my treatment as a research subject? Contact the UWM IRB at XXX-XXX-XXXX or XXXX@XXXX.edu

**Research Subject's Consent to Participate in Research:**

By entering this survey, you are indicating that you have read the consent form, you are age 18 or older and that you voluntarily agree to participate in this research study.

**Thank you!**

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Sample Data Sharing Agreement

Data sharing agreement

between

UW-Milwaukee DETA Research Center

and



“Your Institution”

This Data Sharing Agreement is entered into by and between the UW-Milwaukee DETA Research Center (DETA) and “Your Institution,” as the recognized custodians of data contained within the student information system. The purpose of the agreement is to establish the content, use, and protection of data needed by DETA to conduct cross-institutional research as supported by the U.S. Department of Education FIPSE grant.

### **1.0 Period of Agreement**

The period of this Agreement shall be in effect from December 2015 through the termination of the research at the end of the November 2016 semester.

### **2.0 Intended Use of Data**

The data being supplied to DETA from “Your Institution’s” student information system is intended for use in facilitating cross-institutional scientific research to improve distance education. The data will be used solely for this purpose and only for the duration of the project.

### **3.0 Constraints on Use of Data**

Data supplied by “Your Institution,” to DETA and the contracted agent or collected by DETA and/or the contracted agent on behalf of the students is the property of “Your Institution.” Identifiable data shall not be shared with other parties external to DETA without the written permission of “Your Institution.” Student data shall not be sold or used, internally or externally, for any purpose not directly related to the scope of work defined in this agreement without the written permission of “Your Institution.”

### **4.0 Data Security**

DETA shall employ industry best practices, both technically and procedurally, to protect “Your Institution’s” data from unauthorized physical and electronic access. Methods employed are subject to annual review and approval by UW-Milwaukee.



#### 4.1 Data Elements

Data shared with DETA and the contracted agent shall be limited to the data elements specifically defined and authorized. If DETA, or the contracted agent, wishes to collect additional data, a written request must be submitted. Under no circumstances shall DETA or the contracted agent collect any information classified as Sensitive or Confidential without the express written approval. Data to be shared or collected shall be limited to the following elements:

#Name (first, middle, last)

^Student ID

#### 4.2 Data Categories

The following definitions shall be used to classify data for security purposes:

**#Normal:** The least restrictive class of data. Although it must be protected from unauthorized disclosure and/or modification, it is often public information or generally releasable as “Directory Information” under University procedures for processing public records requests.

**^Sensitive:** This class includes data for which specific protections are required by law and are not releasable as “Directory Information.”

NOTE: While data may be releasable as “Directory Information,” when these elements are provided in combination they may be used to compromise an individual’s identity. As such, both data categories must be properly secured and may not be shared with individuals outside of UWM and the contracted agent.

#### 4.3 Data Handling Requirements

Data handling requirements may vary depending on the classification of data shared with DETA and the contracted agent. However, it is anticipated that most data shared with DETA and the contracted agent will involve a mix of data classes including normal and sensitive information. Therefore, whenever data elements are aggregated for collection, transmission, or storage, the aggregate data shall be handled using the protocols that apply to the most sensitive data element.





## 5.0 Personnel

### 5.1 Access to Data

DETA and the contracted agent shall limit access to normal and sensitive data to those staff members with a well-defined educational or business need.

### 5.2 Security Training

DETA and the contracted agent shall provide periodic training for staff on internal security policies and procedures, and on applicable state and federal legal requirements for protecting data.

### 5.3 Prohibition on Mobile Devices and Removable Media

DETA and the contracted agent shall have a written policy prohibiting the transfer or storage of unencrypted student information on mobile devices or removable storage media for any reason. This policy shall be made available to each staff member individually and shall be strictly enforced.

## 6.0 Compliance with Applicable Laws and Regulations

DETA and the contracted agent shall comply with all applicable federal laws and regulations protecting the privacy of students, including but not limited to the Family Educational Rights and Privacy Act (FERPA).

### 7.0 Notification of Security Breaches

Wisconsin Act 138 (Section 895.507) delineates notification requirements in the event of a breach in the security of personal information. DETA and the contracted agent agree that in the event of any breach or compromise of the security, confidentiality or integrity of computerized data where personal information of a UW-Milwaukee student was, or is reasonably believed to have been, acquired and/or accessed by an unauthorized person, DETA and/or the contracted agent shall notify **“your institution”** of the breach of the system containing such data within 24 hours, comply with all notification actions, and/or assist UW-Milwaukee with all notification actions required by University policy and the law.



**8.0 Amendments and Alterations to this Agreement**

DETA, “**your institution,**” or the contracted agent may amend this Agreement by mutual consent, in writing, at any time.

**9.0 Termination of Services**

In the event either party terminates this Agreement, or the contracted agent ceases operation, all data collected in the course of providing the service shall be returned to “your institution.” DETA and the contracted agent shall certify in writing within five business days that all copies of the data stored on the agent’s servers, backup servers, backup media, or other media including paper copies have been permanently erased\* or destroyed.

\*“permanently erased” means the data have been completely overwritten and are unrecoverable. File deletions or media high level formatting operations do not constitute a permanent erasure.

---

By the signatures of their duly authorized representative below intending to be legally bound, agree to all of the provisions of this Data Sharing Agreement.

UW-Milwaukee

DETA Research Center

3213 E Kenwood Ave

Milwaukee, WI 53201

By:\_\_\_\_\_

Title:\_\_\_\_\_

Telephone:\_\_\_\_\_

Email:\_\_\_\_\_

Signature:\_\_\_\_\_



Date: \_\_\_\_\_

Your institution

Address

Telephone

Email

By: Signing authority's name (potentially the registrar)

Title: Signing authority's title

Telephone: xxx-xxx-xxx

Email: xxx@xxxxxx.edu

Signature:

Date:

# What Works Clearinghouse Standards



A summary of .WWC 3.0

## What study design meets WWC Standards?

*Meets WWC group design standards without reservation:* randomized controlled trials in which participants are assigned randomly to two or more groups that are differentiated by whether they receive the intervention (preferred).

*Meets WWC group design standards with reservation:* quasi-experimental design studies in which groups are compared after the establishment of a baseline from the analytic group (the sample who remained at the end of the study). Equivalence must be demonstrated separately for each outcome domain.

- If the difference between groups on an observable characteristic is greater than .25 standard deviations in absolute value, the groups are not deemed equivalent.
- If the difference is between .05 and .25 standard deviations, statistical adjustment needs to be made in order for the groups to be deemed equivalent, including regression adjustment and ANCOVA.
- If the difference is less than .05 standard deviations, baseline equivalence is satisfactory.

## Testing for Reliability

What is the *minimum* accepted reliability?

- Cronbach's alpha (inter-item consistency): > .5
- Test-retest: > .4
- Inter-rater (kappa, ICC, etc.): > .5

## Missingness

- Imputed baseline variables not acceptable. Dropping the missing is acceptable.



**Effect sizes** (translated to “improvement index”)

For continuous outcomes, WWC prefers Hedges’  $g$

For dichotomous outcomes, the Cox index is the preferred measure

.25 standard deviations is considered “substantively important”

Collapsing categorical levels is acceptable for effect size purposes

**Characterization of Findings** of an Effect based on a Single Outcome

*“statistically significant positive effect”* – the estimated effect is positive and statistically significant (correcting for clustering when not properly aligned)

*“substantively important positive effect”* – the estimated effect is positive and not statistically significant but is substantively important

*“indeterminate effect”* – the estimated effect is neither statistically significant nor substantively important

*“substantively important negative effect”* – the estimated effect is negative and not statistically significant but is substantively important

*“statistically significant negative effect”* – the estimated effect is negative and statistically significant (correcting for clustering when not properly aligned)

**Significance**

$p < .05$

ICC default is .2 for achievement outcomes and .1 for behavior and attitudinal outcomes

**Sample Size** for “Evidence for an Intervention”

Medium to Large = More than one study, more than one setting, and 350 students (25 students in 14 classrooms across studies)

Small = Only one study, OR only one setting, OR fewer than 350 students

- (350 based upon power analysis for 80% probability)



## Help and Support



*The welcome letter is intended to provide you an introduction to the grant goals and research efforts.*

### Website

<http://uwm.edu/deta>

### E-mail

[deta-staff@uwm.edu](mailto:deta-staff@uwm.edu)

### Twitter

Mention @uwmdeta or visit <http://twitter.com/uwmdeta>

Use/search the hashtag #DETAResearch and connect with others

# Appendices

## Appendix A: Student Goals Survey



*A description of the student goals measure by Matthew Mayshiba, DETA Research Fellow.*

Determining how students define success and how these definitions vary among traditional, blended, and distance learners has implications not only in directing educational research but for policy makers and higher education practitioners as well. While studies exist that give high-level answers to these questions for traditional students (Eagan, et al, 2014), the following instrument provides a more complete and focused look at student goals and expectations as they enter online academic programs. Specifically, this instrument includes items that examine professional goals from the perspective of a continuing student and more explicitly examines the role of family and friends. In taking this approach, this instrument fills a gap in existing understanding and ensuring research and practice remain in line with the needs of the learner.

### **Procedures**

This instrument is designed to be administered to students as they begin their academic program. Furthermore, the instrument is worded to be most applicable to students entering a formal degree program rather than a certificate program, although some of the language could be easily adapted for a different audience. Finally, this instrument was designed to measure student goals at the program-level rather than the course-level. As a result, administering this survey at the course-level would likely require significant modifications to the items and constructs involved.

In this survey, students are asked to review 14 items and respond to each on a 5-point Likert scale increasing from 1 to 5 with each point corresponding to strongly disagree, disagree, neutral, agree, and strongly agree. Each item begins with the stem, "I am interested in this program because..." to ensure a consistency of topic. While the items are grouped below by theoretical construct, question order should be randomized when the instrument is administered.

### **Background**

The items in this instrument were developed based on a grounded-theory, qualitative analysis of student goals as recorded during the recruitment and application process for the University





of Wisconsin (UW) Flexible Option, a fully online, competency-based, direct-assessment program offered as a collaboration among UW-Extension, UW Colleges, UW-Milwaukee, and UW-Parkside. The responses were collected as part of the normal recruitment process when students were asked about their “Career Goals” during a phone interview with recruitment staff. The responses were then recorded and stored as part of their file and retrieved for this analysis. After an initial analysis was complete, the research team validated the identified constructs during a focus group with program success coaches, who are the staff that have the most interaction with enrolled students on a day-to-day basis.

The analysis revealed that these responses included four broad theoretical constructs: learning goals, professional goals, academic goals, and social goals. Learning goals included responses that touched on themes of personal growth and improvement, seeking challenges, or increasing personal knowledge and understanding. Professional goals included a variety of responses that had to do with career advancement or career change, and increasing job security and marketability. Academic goals included statements about fulfilling long-standing academic goals, using previously completed coursework, or preparing for further studies beyond the program to which they were applying. Finally, social goals could include helping others or society as a whole, providing an example to friends and family, or responding to the examples provided by peers and role models.

While the research team primarily relied on a grounded theory approach to its qualitative analysis, a review of the literature validates the robustness of the identified constructs. Ng (2008) identified mastery, performance, professional, and social goals in a quantitative analysis of students in Hong Kong. Of these constructs mastery goals were very similar to learning goals, performance goals bore resemblance to academic goals, and the professional and social goals were broadly comparable. Lyall and McNamara (2000) identified vocational, financial, personal, and academic motivations in a qualitative analysis of distance learners in Australia. While Lyall and McNamara did not provide specific definitions of these constructs, vocational and financial motivations may have translated roughly to professional goals, personal motivations may have been roughly equivalent to social goals, and academic motivations might have been considered roughly equivalent to academic goals. Finally, Eagan, et al. (2014) conduct an annual survey through the Higher Education Research Institute that includes items dealing with general education, professional advancement, and preparing for further



academic studies. While these items are worded to apply mostly to traditional students moving directly from high school into postsecondary studies, these constructs bear significant similarities to the learning, professional, and academic goals outlined in our analysis.

### References

- Eagan, K., Stolzenberg, E.B., Ramirez, J.J., Aragon, M.C., Suchard R.S., and Hurtado, S. (2014). *The American Freshman: National Norms Fall 2014 – Expanded Edition* (p. 61).
- Lyall, R. and McNamara S. (2000). Influences on the Orientations to Learning of Distance Education Students in Australia. *Open Learning*, 15(2), 107-122.
- Ng, C.C. (2008). Multiple-Goal Learners and their Differential Patterns of Learning. *Educational Psychology*, 28(4), 439-456.

## Appendix B: Presence Survey



*A description of the presence survey measure by Simone Conceição, DETA Research Fellow.*

### **Conceptual Framework Informing Instrument**

This survey instrument is based on the Being There for the Online Learner Model (Lehman & Conceição, 2010). In this model, the learning process is molded by the thoughts, behaviors, and emotions of the learner and is influenced by two key elements: types of experiences and modes of presence. The types of experiences are subjective (personal and psychological illusion of being in another location), objective (feeling of being psychologically and physically in another location), social (sense of being and interacting with others in the online environment), and environmental (ability to access, change, provide input about, and interact with the online environment). The modes of presence are realism (a close match between the real and the virtual world), immersion (illusion of presence through virtual reality), involvement (personal, interactive engagement with others), and suspension of disbelief (psychological “letting go” of reality). The “illusion of nonmediation” is created in each mode, so that the learner no longer perceives the existence of the medium in the online environment and responds as though the medium was transparent.

This model brings together the social, psychological, and emotional aspects of presence.

The psychological aspect of presence in the online environment creates an illusion of being together with others in the same location wherein technology seems to disappear. The emotional aspect of online presence is the authentic connections and communications that show feelings through words, symbols, and interactions. In the online learning environment, emotions affect the thoughts and behaviors of learners creating a dynamic interplay between emotions, thoughts, and behaviors (Lehman & Conceição, 2010).

### **Survey Development, Measurements, and Results**

This survey instrument was developed collaboratively by a team and conducted in two phases:



**Phase 1: Development of Questions.** The “Being There” model was deconstructed into its two main component parts: the types of experience (subjective, objective, social, and environmental) and modes of presence (realism, immersion, involvement, and suspension of disbelief). To develop the instrument, questions were created for each type of experience and each mode of presence. Four questions per subscale were generated resulting in a total of 32 questions. The survey instrument initially consisted of 32 items with two main factors composed of four sub-scales. The 32 items included a 5-point Likert-scale with response choices Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree. These questions were then randomized prior to the next phase.

**Phase 2: Refining the Instrument.** Cognitive testing was conducted with an initial group of four participants who had taken two or more online courses. Based on participant feedback, the questionnaire was revised to remove confusing terminology. Institutional Review Board approval was obtained and the survey was administered via an online platform.

Demographic information (gender, level of study, employment status, ethnicity, enrollment status, preferred learning format, number of online courses taken, and age) of the respondents was included at the beginning of the survey.

After data collection, confirmatory factor analysis was performed and a two-factor model was identified. Findings indicate that interactions between people and a sense of validation, recognition, and acknowledgement were associated with experiencing a sense of presence.

The modes of presence were associated with a sense of transparency and absence of technology. This study confirmed the presence model and the two-factor construct: types of experience and modes of presence. It also generated and verified a presence instrument with a total of 20 items.

## References

Lehman, R. M., & Conceição, S. C. (2010). Creating a sense of presence in online teaching: How to "be there" for distance learners (Vol. 18). John Wiley & Sons.

[END]



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