Using SmarterMeasure Data to Help Measure the Impact of Other Student Services

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Housekeeping

- Participants will be muted
- Use chat in Zoom to ask questions

SmarterServices

- Webinar will be recorded
- Please participate in survey





2002 Year Established



1000+ Client Institutions Served

1,500,000+

Assessments Proctored



6.5 Million Students Assessed for Readiness



• SmarterServices

Assessment Services



• SmarterServices

SmarterMeasure

First to market and industry leader in non-cognitive assessment and taken by over 6 million students

SmarterProctoring

First and only complete proctoring management system that accommodates all proctoring modalities



Agenda

- Introduction to the SmarterMeasure Learning Readiness Indicator
- 2. Implementation Plan
- 3. Quasi-experimental Research Designs
- 4. Tutoring Outcomes Analysis





Poll -Familiarity and Comfort Level With Data



Scales and Subscales

INTERNAL



Individual Attributes

Motivation, control over procrastination, willingness to ask for help, locus of control, time management, persistence, academic attributes

Learning Preferences

Based on the multiple intelligences model

EXTERNAL



Life Factors

Availability of time, support from family and employers, appropriate place for studying, health, finances



Scales and Subscales

SKILLS



Reading On-screen reading rate and recall

Technical Competency

Skills test of digital learning skills and the degree to which technology is integrated into a person's life

LMS Competency

Familiarity of and skills with using a learning management system

Technical Knowledge Knowledge of terms related to learning in a technology rich environment

> Keyboarding Rate and accuracy

OTHER



Cognitive Math readiness – Fractions, factoring, decimals, equations, percentage, integers currency, time, geometry, computation

Writing readiness – Grammar, usage, style, structure, apprehension

Additional

Essay questions, self-rating items, student resource inventory



Poll - RESULTS



: SmarterServices

Implementation Plan



Gateway Technical College

- Southeast Wisconsin tri-county area: Racine, Kenosha, Walworth
- Public 2-year college
- 2022 enrollment: 7,814 program students (3,209 FTEs)
- Open Access many at risk students
 - 52% economically disadvantaged
 - 18% single parents
 - Mostly part-time, working adults
 - Est. 40% housing insecure and 31% food insecure
- 62% retention rate (year 1 to year 2)
- 45% 3rd year graduation rate





A Solution for Retention: First Year Seminar

Gateway to Success

- 1 credit course
- Mandatory for all associate degree and technical diploma students
- Course Description:

In this course, students explore the Gateway Technical College community. They examine college resources and services, investigate skills that lead to academic success, and identify strategies for achieving educational and personal goals.



Leveraging the SmarterMeasure Assessment for Retention

First Year Experience

SmarterMeasure

- Get them early
- Greater response rates
- Online readiness
- Assess risk and develop referral systems



Assessment volume increased with the start of Gateway to Success

of Assessments Over Time



Calendar Year



Tutoring at Gateway

- Tutoring offered onsite and virtually (e.g., Zoom)
- Appointments and drop-in tutoring available
- General hours of operation (adjusts semester-to-semester based on demand) M-Th 9am - 7pm; Fri 9-2
- Professional tutors and peer tutors available
- Avg. duration 1.6 hours per session
- Most common courses English Comp 1 and Quantitative Reasoning



Tutoring at Gateway

- Assessing student goals for the tutoring session
- Assessing student's current skills and scaffolding new skills
- Use strategies that empower students to learn and apply to concepts
- Use of reciprocal questioning
- Retrieval practice and feedback centered on growth mindset language
- The person doing the work is doing the learning (modeling behaviors but not doing the work for the student)
- Continuous communication between tutors, leadership, and classroom instructors
- Utilize data to drive tutor hiring and hours of tutor offerings (time, subject, and length of hours)
- A majority of our tutors are content specialists, not professional educators (current constraint)





Tutoring at Gateway

What makes for an effective tutoring program at Gateway:

"Continuous communication between tutors, leadership & classroom instructors."

"Retrieval practice and feedback centered on growth mindset language."





Program Evaluation & Research Design





Research Question

Is tutoring an effective intervention?

If so, how effective is it?

Does it increase course pass rates?

Is it related to retention or graduation in any way?





Experimental Design



Treatment group (the real drug)

Control group (the placebo)



Simple Comparison

Tutoring Recipients



Those who didn't receive tutoring





Matching Comparison Group

Tutoring Recipients (treatment group)

Those who didn't receive tutoring (Apples = comparison group)



Matching Comparison Group



Simple Comparison Group





Matching Comparison Group



"Nearest Neighbor"



Why Use the SmarterMeasure Assessment?





SmarterMeasure Scales Utilized

INTERNAL



Individual Attributes Motivation, control over procrastination, willingness to ask for help, locus of control, time management, persistence, academic attributes SKILLS



EXTERNAL

Life Factors Availability of time, support from family and employers, appropriate place for studying, health, finances

Technical Competency Skills test of digital learning skills and the degree to which technology is integrated into a person's life

Technical Knowledge

Knowledge of terms related to learning in a technology rich environment



Selecting a Matching Tool

- We chose the SmarterMeasure assessment for these reasons:
 - Non-cognitive traits
 - Feasibility
 - Timing
 - Response rates

Side note - if you use this methodology to evaluate programs that have certain eligibility requirements, make sure you account for those in your matching process as well

E.g. if you have a support program for women in STEM, then your matching comparison group should also only include women in STEM



Data Preparation and Analysis





The Step-by-Step Process



01

Prepare the Data 02

Run SPSS Case-Control Matching 03

Compare outcome variables between groups



Prepare the Data

Student

Data

Tutoring

Data

Smarter-Measure Scale Data Enrollment records Course completion rates Retention and graduation rates

Dates of use Duration of each session Course

Individual Attributes

Technical Competency

Technical Knowledge

Life Factors

<u>Combine</u> <u>into master</u> <u>data set</u>

Connect data sets using Student ID



Master Data Set (all students)

Comparison Group (Matched students who did not use tutoring)

Intervention Group (Students who used tutoring)

Unmatched Students (Students who were not matched)













Outcomes Analysis



Course Completion Rates

100%

Students who used any amount of tutoring during their first year at Gateway had almost 6 percentage points higher course completion rates than those who used no tutoring.



Pre and Post Data

Year 1 (pre-assessment): Neither group used tutoring

Year 2 (post-assessment):

- The tutoring group experienced an 8.2 pp increase in course completion rates
- The comparison group experienced an 8.7 pp decline in completion rates.





English Comp 1 - Course Completion Rates



Students who received tutoring for English Composition 1 had 24 percentage points higher course completion rates. Students who used tutoring for Quantitative Reasoning had 4 percentage points higher course completion rates.

Quantitative Reasoning - Course Completion Rates



2nd Year Retention Rates

100%



Students who used any amount of tutoring during the first year had slightly higher 2nd year retention rates.

The difference was <u>not</u> statistically significant (could be a result of chance).



The difference was <u>not</u> statistically significant (could be a result of chance).





Assessment Comments

- Tutoring demonstrates a **positive impact on course completion rates** overall.
 - On a course level, this was especially true for English Comp 1 but also for Quantitative Reasoning to a lesser extent.
- Any impact on retention and graduation rates was inconclusive.





Next Steps



Future IR Goals

- Implement data warehouse to improve the data collection and transformation process
- Case-control assessment of...
 - Orientation
 - Academic advising (it's not mandatory at Gateway)
 - HEADS UP mentoring program
 - Promise Program
 - Scholarship/Emergency grant recipients
- Regression analysis for students who receive more than one form of intervention





Future Retention Goals

- Early risk assessment
- Automated service referrals
- Integrate into advising and support processes







Questions and Answers

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SmarterMeasure - Dr. Mac Adkins

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SPSS Instructions for Case-Control Matching

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Q Search application

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Step-by-Step Process



Run SPSS Case-Control Matching

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Û		Case-Control Matching			×
		Variables: PERSONALATTRIBUTESPCT TECHKNOWLEDGEPCT	Â	Variables to Match on:	<u>O</u> ptions Additional Output
Men	iu: Data / Case C	Control Matching	•		
(A)	Input your match variables or othe	ning "covariates" (SmarterMeasure scale er variables you want to use for identifying	в	Match Tolerances:	
(B)	 Match Tolerance Must include 	 a group) b - for categorical variables, use a 0 b for each matching variable 		0 0 0 0 If matches have a tolerance (fuzz) factor enter the tolerance for each match variable separated by blanks	
(C)	Group Indicator they received the	- binary variable describing whether or not e intervention		Group Indicator: Tutoring Usage [TutoringUsage] Case ID:	
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(F)	group (both will	have same code) /" for match group variable	Ð	Name for Matc <u>h</u> group Variable (must not already exist): MGV	
(G)	Before closing.	click Additional Output	ОК	Paste Reset Cancel Help	

Create Output for Matched Comparison Group

(A) Check the box "Create new dataset of matches"

- (B) Give it a name
- (C) Click Continue and then Ok

This will open a new SPSS window including only your matched students from the comparison group (those who did <u>not</u> receive tutoring).

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Double-Check Your Work

You should now have two SPSS datasets:

- 1. Your original file (includes all records; the new Match_ID field has some blank rows and some rows with data)
- 2. Your new data file ("Comparison_Group"; includes comparison group data records; Match_ID field should have data in all rows; tutoring usage or other group indicator variable should be all the 0s)

Also check the sample size of your comparison group. If your sample is too small for a strong analysis, you may need to decrease the number of matching variables or increase your fuzz tolerance. However, you don't want to make these too lenient, where your comparison group no longer closely matches your intervention group. This should be an iterative process of optimizing your sample size and while limiting fuzz tolerance.



Create output for Treatment Group (part 1)

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This will select the cases where the Match_ID is <u>not</u> null or 0, which selects your treatment group.

Create Output for Treatment Group (part 2)

In the pop-up, click "Continue," but don't click "Ok" yet.

In the original dialog box...

- (A) Select radial for "Copy selected cases to a new dataset"
- (B) Give new dataset a name such as
 "Treatment_Group" or
 "Intervention_Group"

•	Select
Student ID [Stu PERSONALAT PERSONALAT TECHKNOWLE TECHKNOWLE TECHCOMPPCT TECHCOMP LIFEFACTORS LIFEFACTORS LIF_POINTS LF_PLACE LF_REASON LF_RESOURCES LESULLS	 <u>A</u>II cases If <u>c</u>ondition is satisfied <u>If</u> match_id ~= 0 O Random sample of cases <u>Sample</u> O <u>B</u>ased on time or case range <u>Range</u> O <u>U</u>se filter variable: <u>O</u> <u>U</u>se filter variable: <u>O</u> <u>U</u>se filter variable:
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Double-Check Your Work

You should now have <u>three</u> SPSS datasets:

- 1. Your original file (includes all records; the new Match_ID field has some blank rows and some rows with data)
- 2. Your new data file ("Comparison_Group"; includes comparison group data records; Match_ID field should have data in all rows; tutoring usage or other group indicator variable should all be 0s)
- 3. Your new data file ("Treatment_Group"; includes treatment group data records; Match_ID field should have data in all rows; tutoring usage or other group indicator variable should all be 1s)

Merge Treatment and Comparison Groups to Create New Final Data Set

In your treatment group file, click on the Menu: Data / Merge Files / Add Cases

- (A) Select the Comparison_Group data set
- (B) Click Continue
- (C) Click Ok on the next pop-up







Double-Check Your Work

In the Treatment_Group dataset, you should now also have the Comparison_Group data added into the data.

Items to check:

- Every single row should have data in the Matching_ID field
- For the original group variable you had selected (for us, "Tutoring Usage"), you should have all the 1s in the first several rows, and all the 0s in the last several rows



Compare Groups for Similarity of Matching Variables

For categorical data, we will run a chi-square test to make sure that the distribution of students in the different SmarterMeasure scales are well-matched between the intervention and comparison groups.

- (A) Click Analyze
- (B) Descriptive Statistics
- (C) Crosstabs

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20	5	13	9	61.62	1		.5000000000000000	.666666666666666	.00000000000000000		. 17
21	6	9	7	66.49	1		1.0000000000000000	.666666666666666	.00000000000000000		. 14
22	20	16	10	81.35	1		.384615384615385	.894736842105263	.769230769230769		. 1.2
23	19	10	4	78.11	1		1.0000000000000000	.8000000000000000	1.00000000000000000		0
24	8	16	9	78.11	1		.8000000000000000	1.0000000000000000	1.00000000000000000		7
25	10	8	7	68.65	1		1.00000000000000000	.384615384615385	.714285714285714		0
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Compare Groups for Similarity of Matching Variables



Note - use chi-square if the variables are categorical; use t-test if the variables are numerical

Compare Groups for Similarity of Matching Variables

The SPSS output will provide the following charts for each variable.

Yellow Circle - your cross tab should show the same number of students in each category (fail, pass, questionable) for both the students who used and did not use tutoring.

Green Circle - the p-value should be 1.000, showing that the treatment and comparison groups are <u>not</u> significantly different when it comes to this variable

Check these charts for every single variable used in the matching process. If you find variables that are significantly different between students who did and did not use tutoring, then something went wrong, and you'll need to re-run the matching procedures.

Tutoring Usage * PERSONALATTRIBUTES

		Cross	tab		
Count					
		PERSC			
		fail	pass	question	Total
Tutoring Usage	0	140	25	251	416
	1	140	25	251	416
Total		280	50	502	832

C	hi-Square	Tests	
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.000ª	2	1.000
Likelihood Ratio	.000	2	1.000
N of Valid Cases	832		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 25.00.



Save SPSS File and/or Export to Excel

Assuming everything looks good, you can now save the final SPSS file. Give it a new name (don't use "treatment group") since now it includes both the treatment and comparison groups.

This final combined file is what you will use for analyzing your student outcome variables (e.g. course pass rates; retention/graduation rates).

You can also export the data to excel if you prefer to run your analyses in different statistical packages such as R.

Note - You do not need to keep the other SPSS files unless you would like a record of your work.

