



WILLIAM WOODS
UNIVERSITY

MA Psychology Annual Assessment 2023-2024

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Graduate Annual Assessment 2023-2024

Master of Arts in Psychology

Program Profile

Program Mission

Our Master of Arts in Psychology program offers students advanced courses in the major areas of psychology as well as a strong foundation in research design and statistical analysis. Our program provides students with a broad knowledge base applicable in a variety of settings.

Students graduate prepared for career opportunities, as well as for PhD programs, in psychology or related fields. This program is perfect for professionals looking for career growth as well as individuals looking for more experience before applying to PhD programs. It is 100% online and can be completed in as little as one year.

Program Demographics

Total Enrollment 2022-2023

Total Enrollment 2023-2024

6

Graduating Students

Total Graduated 2022-2023

Total Graduated 2023-24

Program Assessment Data Sheet

Upload the Assessment Data sheet from Institutional Research

MA_in_Psych.xlsx

Reflection on Demographic Data

Program goals for student retention, persistence and degree completion are? What do the persistence numbers mean to the faculty in the program? Are your persistence numbers what you expected? If not, how could the numbers be improved? What is the optimal enrollment for the program?

This program is still in its infancy, so it is difficult to speak on the student demographics at this point. Approximately 50% of the current students are graduates of our bachelor's degree, which demonstrate student satisfaction and successful recruitment effort on the part of the faculty. However, in order for the program to remain viable, recruitment efforts will need to extend beyond William Woods University undergraduate students, especially if we are to expedite time to graduate, making it more difficult to develop a critical mass.

Optimal enrollment for this program would be 30-60 students per 12 month period with 10-20 enrolled in each concentration.

Program Delivery

Cohort
Online (selected)
Hybrid
Cohort and Online

External Accreditation

Does the program hold external accreditation?

Yes
No (selected)

If yes, state the name of the organization.

Along with the name of the organization, please note the date of approval, and the date of review.

Marketing Materials

Reflect on the current marketing materials used for the program. Please attach screenshots of the website or any material you are referencing in this section. What changes, if any, should be made to the material? Are there recommendations on how to modify the current material?

We are satisfied with the program sheet that was developed by the marketing team. Currently we have about 1-2 students start each term, which has allowed us to slowly roll out the program, but for program viability, recruitment efforts will need to be more aggressive. Recruitment could be targeted at other local universities and colleges with undergraduate but not graduate programs. Efforts should also be placed on individuals in career fields where they receive incentives for earning a masters degree.

Marketing Attachments

MA_Psychology_Program_Sheet.pdf

Faculty Teaching

Please either fill in the box or upload a document outlining the faculty loads for those who are actively teaching in the program. "Active" includes individuals who have taught within the past year for the program. Include if the faculty are full time or part time as well and how many classes they are teaching.

Dr. Caroline Boyer- fulltime- 2

Dr. Julian Hertzog- fulltime- 1

Dr. Sarah Greenland-White- fulltime- 1

Dr. Crystal Sivia- fulltime- 2

Dr. Brandy Baczwaski- partime- 1

Faculty Load Attachment

If you want to attach the load document you can do that here.

Program Objectives

Standard/Outcome

Identifier	Description
WWU2021.1	Knowledge and Scholarship: Demonstrate current knowledge and educational expertise in an academic or professional discipline engaging students in the process of academic discovery.

Additional Standards/Outcomes

Identifier	Description
PSY MA.1	Knowledge Base in Psychology- The master's graduate in psychology demonstrates a broad knowledge of psychology's core domains, knowledge of psychology as a science, and advanced knowledge in an area of concentration. The knowledge base is distinguished from the baccalaureate level by the ability to analyze and integrate information across the major domains of psychology.
PSY MA.2	Scientific Mindedness- The skills involved in achieving this goal enable the student to evaluate literature sources with informed critical thinking; integrate various concepts, principles, and theories to formulate plausible explanations for behavior; solve problems in a variety of settings; and carry out their roles in science and practice with appropriate attention to cultural diversity and intersecting identities.
PSY MA.3	Ethical and Social Responsibility in a Diverse World- Graduates earning a master's-level degree recognize that serving in the profession, regardless of the specific area of concentration, involves recognizing and embracing the ethical standards of the discipline. They understand that they are likely to manage complex ethical circumstances in research and/or practice contexts. They strive to respond appropriately to ethical challenges that may arise when working with diverse individuals, groups, and communities who represent various cultural and personal backgrounds.
PSY MA.4	Communication- Master's graduates in psychology demonstrate competence in written, oral, and interpersonal communication skills in multiple formats and contexts. They express psychological concepts clearly and with culturally appropriate adaptations for different audiences.
PSY MA.5	Professional Development- Individuals with a master's degree in psychology are able to apply their knowledge and skills to achieve professional success. Graduates may pursue professional opportunities in a variety of areas, but they will display a higher level of independence in their professional performance than would be evident at the baccalaureate level.

Alignment with Institutional Objectives

Please discuss the program alignment to the University Objectives. We do not need an artifact for each objective, but a discussion on how the program uses the Institutional Objectives as an anchor for their program curriculum.

- **Major Field Competence: Students will demonstrate excellence in an academic or professional discipline, and engage in the process of academic discovery.**
 - *All of our courses cover the main theories and key research in the field. Students are required to engage with recent research in all courses. Students are required to complete a capstone or thesis project that is relevant to their career field.*
- **Ethics: Students will exhibit values and behaviors that address self- respect and respect for others that will enable success and participation in the larger society.**
 - *Students are expected to know the ethical guidelines for psychology as outlined by the APA, these are specifically covered in PSY 535 and PSY 570. Students are then expected to apply these in the relevant coursework in their concentrations.*
- **Self-Liberation: Students will develop an honest understanding and appreciation of themselves and others resulting in an ability to make individual decisions.**
 - *Psychology is the scientific study of the mind and behavior. Understanding their own behaviors and the influences on them, as well as the behaviors of others, gives students an appreciation for themselves and others and allows them to make decisions accordingly. Students are expected to demonstrate this throughout their coursework, but they are assessed on their plans for professional development (PSYMA obj. 5) in their capstone/thesis course.*
- **Lifelong Education: Students will possess an intellectual curiosity and desire for continual learning both within and beyond formal education in preparation for participation in a global society.**
 - *Students are expected to apply their learning to real world problems. All courses require students to make practical application of course material in a way that is relevant to their career paths. Specifically in their capstone/thesis project, students produce a product that is relevant to their career goals.*

Curriculum Map

A - Assessed
 R - Reinforced
 I - Introduced
 M - Master

Curriculum Map

	EDU 520	PSY 510	PSY 520	PSY 525	PSY 530	PSY 535	PSY 550	PSY 570	PSY 580	PSY 590	PSY 591
PSY MA.1 Knowledge Base in Psychology- The master's graduate in psychology demonstrates a broad knowledge of psychology's core domains, knowledge of psychology as a science, and advanced knowledge in an area of concentration. The knowledge base is distinguished from the baccalaureate level by the ability to analyze and integrate information across the major domains of psychology.		I	I	I	I	I				M	M, A
PSY MA.2 Scientific Mindedness- The skills involved in achieving this goal enable the student to evaluate literature sources with informed critical thinking; integrate various concepts, principles, and theories to formulate plausible explanations for behavior; solve problems in a variety of settings; and carry out their roles in science and practice with appropriate attention to cultural diversity and intersecting identities.	R		I				R		M, A	M	M, A
PSY MA.3 Ethical and Social Responsibility in a Diverse World- Graduates earning a master's-level degree recognize that serving in the profession, regardless of the specific area of concentration, involves recognizing and embracing the ethical standards of the discipline. They understand that they are likely to manage complex ethical circumstances in research and/or practice contexts. They strive to respond appropriately to ethical challenges that may arise when working with diverse individuals, groups, and communities who represent various cultural and personal backgrounds.	R							R		M	M, A
PSY MA.4 Communication- Master's graduates in psychology demonstrate competence in written, oral, and interpersonal communication skills in multiple formats and contexts. They express psychological concepts clearly and with culturally appropriate adaptations for different audiences.	R	I		I	I	I		I		M	M, A

<p>PSY MA.5 Professional Development- Individuals with a master’s degree in psychology are able to apply their knowledge and skills to achieve professional success. Graduates may pursue professional opportunities in a variety of areas, but they will display a higher level of independence in their professional performance than would be evident at the baccalaureate level.</p>						I		R		M	M, A
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Changes to Curriculum

Are there any changes made to the curriculum map for this academic year? If so, please describe the program changes made along with the rationale for why and the impact the changes should' have on student learning?

The program was changed to include three concentrations, which allows the students to focus on a more specific area of study. This also allows students who do not have ambitions to go on to graduate school to complete an application project in the capstone course instead of being required to complete the thesis project. This change should allow students to have a clearer career path.

For the 2024-2025 school year we plan to also include assessments at multiple points in the the program instead of just in the capstone/thesis course.

Assessment Findings

Assessment Findings for the Assessment Measure level for Curriculum Map

No assessments

Improvement Narrative List

Assessment List

Analysis of the Assessment Process

Describe your assessment process; clearly articulate how the program is using coursework and or assessment day activities for program wide assessment. Note any changes that occurred to that process since the previous year. Discuss what activities were successful at assessment and which ones were not as helpful and why. Please include who met to discuss the changes (unless you are a program of one person) and when you met. – Include a discussion on the process for collection and analysis of program data.

Assessment activities did not occur this year because the program is in its infancy and the courses in which students will be assessed have not yet been offered. Moving forward, we will be conducting more assessment at various places in the program, so we will be able to collect data on student performance.

Program Activities

Student Accomplishments

Highlight special examples of student successes in the field (research, conference presentation, award in the profession). This is for any accomplishment that a student achieved outside of coursework or the normal expectations of student success.

Students have just started their coursework and so no significant accomplishments were recorded this year.

Faculty Accomplishments

Highlight special examples of faculty success in the profession/field/content area. This is for any accomplishment of a faculty activity/research/professional nature

Dr. Boyer was interviewed by the Columbia Tribune for an article about the children's show Bluey

Dr. Boyer was selected for the CIC Senior Leadership Academy

Alumni Accomplishments

Highlight special examples of any successes of any alumni (acceptance to or graduation from a graduate/professional program, new job in the field) including your most recent graduates

We do not yet have graduates for this program since it just launched this year.

Professional Development Opportunities

Highlight professional development opportunities over the course of the academic year that were beneficial to program faculty and or instrumental to student learning. This could be local or external professional development.

Faculty attended the WWU internal professional development event- "HAVING THE KNOW-HOW TO USE TECHNOLOGY WELL: CURRICULUM ALIGNMENT WITH RESEARCH-BASED LEARNING STRATEGIES" by Dr. Lauren Hays. This session provided us with information about how to utilize cognitive psychology principles when developing online courses.

Dr. Boyer completed the Coursera University of Edinburg How To Create an Online Course certificate.

Professional Development

Upload any documentation supporting the professional development offered.

William_Woods_Presentation.pptx.pdf

Assessment Rubric

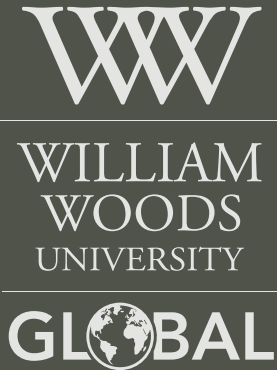
	3.000 Exceeds	2.000 Meets	1.000 Falls Below Expectations	N/A
Mission Statement Clearly Articulated weight: 1.000	✓ The mission statement for the program is insightful and forward thinking. It aligns with the University Mission and learning objectives showing a clear alignment between the University and the program.	✓ The mission statement for the program clearly articulated and aligned with the University mission.	✓ The mission statement is minimal at best.	✓ N/A
Comment:				
Reflection on Student Demographics, Retention, and Degree Completion Data weight: 1.000	✓ The program provides a detailed description on the enrollment, retention, persistence and degree completion numbers. The program provides new ideas on how to improve retention of their program students or articulates what they are currently doing to keep students in their program.	✓ The program provides a basic reflection on enrollment, retention, persistence, and degree completion data provided.	✓ The program does not reflect on enrollment, retention, persistence, and degree completion data in a detailed way.	✓ N/A
Comment:				
Marketing Materials weight: 1.000	✓ The program outlines the successes and needs in regards to marketing. Detailed suggestions on how to market the program and what niche areas that are program specific would benefit the marketing strategy.	✓ The program discussed the general marketing strategy for the program.	✓ The program provided little to no discussion on the marketing materials or approach to how to market the program.	✓ N/A
Comment:				
Faculty Teaching Loads weight: 1.000	✓ The program provides a detailed explanation of teaching loads outlining courses for adjunct and full time faculty. Data is provided that shows percentages and responsibilities in the program.	✓ The program provides a basic explanation who is teaching in the program with no data to provide a complete picture.	✓ The program provides a minimal explanation to no explanation of who teaches in the program.	✓ N/A
Comment:				
Alignment to University Objectives weight: 1.000	✓ The program provides a detailed explanation of how program courses align to the Institutional Objectives. This explanation details specific courses, or activities that coordinate with the intent of the Institutional Objectives.	✓ The program provides a basic explanation of how program courses align to the Institutional Objectives. This explanation provides a minimal understanding of how the program is aligned to the Institutional Objectives.	✓ The program provides little to no explanation of how program courses align to the Institutional Objectives.	✓ N/A
Comment:	the program is aligned to the old university mission			
Curriculum Map alignment and changes weight: 1.000	✓ The curriculum map is detailed and complete. All Changes made to the curriculum map are detailed with supporting rationale for decisions.	✓ The curriculum map is complete. Changes made to the curriculum map are explained with some explanation as to why the changes were implemented.	✓ The curriculum map is not complete and little to no explanation on curricular changes was provided.	✓ N/A
Comment:				

Assessment Map weight: 1.000	✓ Assessment of objectives are spread out across the curriculum with a variety of assessment measures and each program objective is assessed a minimum of twice a year.	✓ Each objective is assessed a minimum of 2 times a year or an assessment rotation is explained so that all objectives are assessed. The assessments are not concentrated in one class.	✓ The assessment map is not complete or much of the assessment happens in only one course. Not all objectives are assessed annually, nor is a plan provided on assessment.	✓ N/A
Comment:				
Data Driven Decision-making is explained weight: 1.000	✓ An overview of program assessment is provided with details on the specific successes and challenges from the year. A detailed review of how assessment was administered over the academic year is clearly outlined.	✓ A basic overview of program assessment is provided with some details on the successes and challenges from the year. A basic review of how assessment was administered over the academic year is outlined.	✓ A basic overview of program assessment is not provided with little to no discussion on the administration of assessment over the academic year.	✓ N/A
Comment:				
Documentation provided on assessment findings weight: 1.000	✓ The program uploads all rubric and support information to support the claims in the assessment findings along with detailed instructions on the assessment process and data analysis.	✓ The program uploads all rubric and support information to support the claims in assessment findings.	✓ The program did not upload the data to support assessment claims in the assessment findings.	✓ N/A
Comment:				
Assessment Findings weight: 1.000	✓ The program completed assessment findings for each component identified, and provided a comprehensive summary of each assessment measure identified in the report.	✓ The program completed the assessment findings for each component and provided a summary for each assessment measure.	✓ The program did not provide a completed assessment findings for each component, nor did they complete the summary for each measure.	✓ N/A
Comment:	the assessment is currently at the end of the program with no students at that stage yet... but the assessment map did not populate due to a lack of creating the assessment assignments. this will be fixed in the new platform.			
Improvement narratives are selected with intentionality weight: 1.000	✓ The program identified Improvement Narratives that appear to move the program forward and see the bigger picture than only the specific program curriculum options	✓ The program used the provided Improvement Narratives and selected options that made sense to the objectives and issues within the assessment.	✓ The program did not use any improvement narratives, or the ones chosen are not aligned with assessment results.	✓ N/A
Comment:				
Faculty, alumni, and Student accomplishments weight: 1.000	✓ The program provided detail updates on successes on Students, Alumni and Faculty with added information explaining the kinds of success that were experienced.	✓ The program provided a listing of information on Students, Alumni, and faculty accomplishments.	✓ The program provided little to no data on students, alumni, faculty accomplishments.	✓ N/A
Comment:				
Professional Development Opportunities weight: 1.000	✓ The program detailed the opportunities for PD as well as any additional PD completed by faculty in the program.	✓ The program provided a basic listing of PD options available and how many faculty participated.	✓ The program provided little to no description of the PD available or participation of faculty.	✓ N/A
Comment:				

Appendix: Supporting Data

Program Activity Report

Program		School				
Master of Arts in Psychology		Social Sciences				
Undergraduate and Graduate Enrollment		Fall 2023	Fall 2022	Fall 2021	Fall 2020	Fall 2019
Total Enrollment	Total	6	-	-	-	-
	Fulton Campus	0	-	-	-	-
	Online	6	-	-	-	-
Undergraduate Enrollment		Fall 2023	Fall 2022	Fall 2021	Fall 2020	Fall 2019
Total Enrollment	Total	-	-	-	-	-
	Fulton Campus	-	-	-	-	-
	Online	-	-	-	-	-
Full-Time Total	Total	-	-	-	-	-
	Fulton Campus	-	-	-	-	-
	Online	-	-	-	-	-
Part-Time Total	Total	-	-	-	-	-
	Fulton Campus	-	-	-	-	-
	Online	-	-	-	-	-
Graduate Enrollment		Fall 2023	Fall 2022	Fall 2021	Fall 2020	Fall 2019
Total Enrollment	Total	6	-	-	-	-
	Fulton Campus	0	-	-	-	-
	Online	6	-	-	-	-
Full-Time Total	Total	0	-	-	-	-
	Fulton Campus	0	-	-	-	-
	Online	0	-	-	-	-
Part-Time Total	Total	6	-	-	-	-
	Fulton Campus	0	-	-	-	-
	Online	6	-	-	-	-
Enrollment by Concentration		Fall 2023	Fall 2022	Fall 2021	Fall 2020	Fall 2019
Human Behavior		4	0	0	0	-
Undecided / Unknown		2	0	0	0	-
Enrollment By Gender		Fall 2023	Fall 2022	Fall 2021	Fall 2020	Fall 2019
Male		0	0	0	0	0
Female		6	0	0	0	0
Other		0	0	0	0	0
Male %		0.00%	N/A	N/A	N/A	N/A
Female %		100.00%	N/A	N/A	N/A	N/A
Other %		0.00%	N/A	N/A	N/A	N/A
Enrollment By Status		Fall 2023	Fall 2022	Fall 2021	Fall 2020	Fall 2019
Full-Time		0	0	0	0	0
Part-Time		6	0	0	0	0
Full-Time %		0.00%	N/A	N/A	N/A	N/A
Part-Time %		100.00%	N/A	N/A	N/A	N/A
Enrollment By Race/Ethnicity		Fall 2023	Fall 2022	Fall 2021	Fall 2020	Fall 2019
U.S. Nonresident		0	0	0	0	0
Hispanic/Latino		0	0	0	0	0
American Indian or Alaska Native		0	0	0	0	0
Asian		0	0	0	0	0
Black or African American		1	0	0	0	0
Native Hawaiian or Pacific Islander		0	0	0	0	0
White		4	0	0	0	0
Two or More Races		0	0	0	0	0
Race and Ethnicity Unknown		1	0	0	0	0
U.S. Nonresident %		0.00%	N/A	N/A	N/A	N/A
Hispanic/Latino %		0.00%	N/A	N/A	N/A	N/A
American Indian or Alaska Native %		0.00%	N/A	N/A	N/A	N/A
Asian %		0.00%	N/A	N/A	N/A	N/A
Black or African American %		16.67%	N/A	N/A	N/A	N/A
Native Hawaiian or Pacific Islander %		0.00%	N/A	N/A	N/A	N/A
White %		66.67%	N/A	N/A	N/A	N/A
Two or More Races %		0.00%	N/A	N/A	N/A	N/A
Race and Ethnicity Unknown %		16.67%	N/A	N/A	N/A	N/A
Graduate Enrollment By Type		Fall 2023	Fall 2022	Fall 2021	Fall 2020	Fall 2019
Degree Seeking	First-Time	3	-	-	-	-
	Continuing / Returning	3	-	-	-	-



Online Master of Arts in

Psychology



THE WILLIAM WOODS DIFFERENCE

Over 150 years of
academic excellence

100% online, 8-week
terms

Possible to complete
in 12-18 months

No GMAT or GRE
required

Schedules designed
for working
professionals

Tuition promise - no
tuition increases when
you stay continuously
enrolled

A Degree for Expanding Intellectual and Professional Goals

PROGRAM OVERVIEW

Our Master of Arts in Psychology program offers students advanced courses in the major areas of psychology as well as a strong foundation in research design and statistical analysis. Our program provides students with a broad knowledge base applicable in a variety of settings.

PROGRAM ADVANTAGES

Students graduate prepared for career opportunities, as well as for PhD programs, in psychology or related fields. This program is perfect for professionals looking for career growth as well as individuals looking for more experience before applying to PhD programs. It is 100% online and can be completed in as little as one year.

“The Master of Arts in Psychology at WWU provides students with real world knowledge that they can apply immediately in both their professional and personal lives. By understanding the factors that underlie human behavior, students will be able to improve the world around them.”

~ Dr. Caroline Boyer,
Professor of Psychology



ADMISSION REQUIREMENTS

- » Completed application
- » Official bachelor's degree transcripts showing a minimum 2.5 GPA from an accredited university or college.

TUITION AND FEES

At William Woods University, we are committed to offering a number of payment options to help you finance your education. We strive to keep the expense to our students as low as the rising costs of providing a quality college education will allow.

We guarantee no increase in tuition once a program has begun provided the student remains continuously enrolled and the modality does not change.

YOUR DEGREE AT WORK

Earning your M.A. opens the door to a wide variety of advanced career options including:

- developmental specialist
- success coach
- project manager
- research analyst
- psychometrist
- consumer psychologist
- behavioral researcher
- consultant

Accreditation details can be found online at williamwoods.edu/accredited

Online Master of Arts in Psychology Courses

This degree is comprised of 30 credit-hours.

PSY 510 Advanced Developmental Psychology

Students read and respond to selected research articles that consider how cognitive, biological and social factors influence development across the lifespan.

PSY 525 Advanced Cognition

Students read and respond to selected research articles that investigate key aspects of cognition, including learning, memory, sensation and perception, attention and language.

PSY 530 Advanced Psychopathology

Psychological symptoms and disorders are examined. Students consider the factors that influence assessment, diagnosis and treatment of psychological disorders.

PSY 535 Contemporary and Ethical Issues

Students read and respond to selected research articles that discuss contemporary issues within the field of psychology. Students discuss case studies and examine how ethics influence decision making.

PSY 570 Diversity and Multicultural Issues

Students discuss how societal factors, such as race, ethnicity, religion, gender and ability status influence human behavior. Students read selected research articles and discuss relevant case studies.

Online Master of Arts in Psychology Concentrations

Students will have the opportunity to choose one of three concentrations (15 credit-hours).

Human Behavior

PSY 520 Biological Bases of Behavior

PSY 540 Advanced Social Psychology

PSY 560 Health Psychology

PSY 576 Psychology of Judgment & Decision-Making

PSY 596 Human Behavior Capstone

Industrial/Organizational Psychology

PSY 545 Organizational Psychology

PSY 555 Workplace Motivation

PSY 565 Leadership Development

PSY 575 Organizational Behavior & Evaluation

PSY 595 Industrial/Org. Psychology Capstone

General Psychology

PSY 520 Biological Bases of Behavior

PSY 590 Thesis

RSH 520 An Introduction to Statistical Research



HAVING THE KNOW-HOW TO USE TECHNOLOGY WELL: CURRICULUM ALIGNMENT WITH RESEARCH-BASED LEARNING STRATEGIES

Lauren Hays, Ph.D.

Associate Professor of Instructional Technology
University of Central Missouri

LEARNING OBJECTIVES

1. Be able to explain learning strategies based in cognitive science such as retrieval practice, interleaving, and spacing.
1. Be able to identify ways to develop educational technology curriculum that is aligned with research from cognitive scientists.
1. Be able to develop ideas for incorporating technology into their classroom that is aligned with learning strategies based in cognitive science.

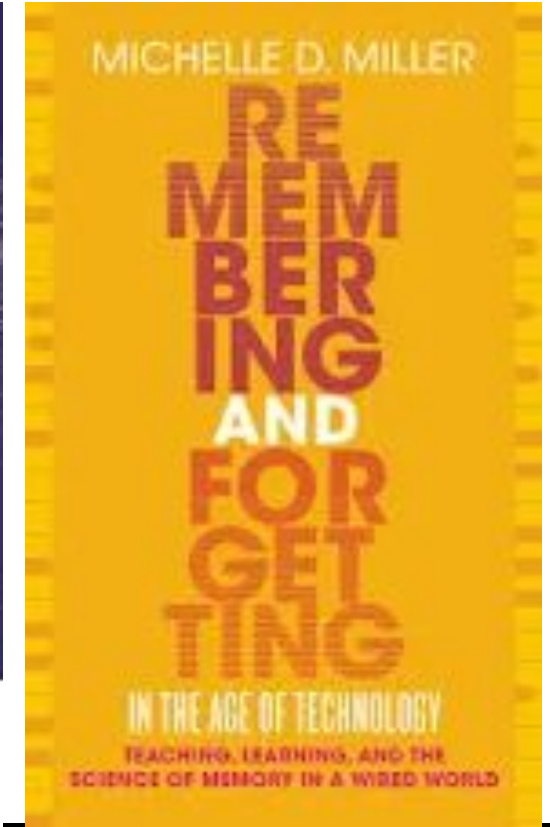
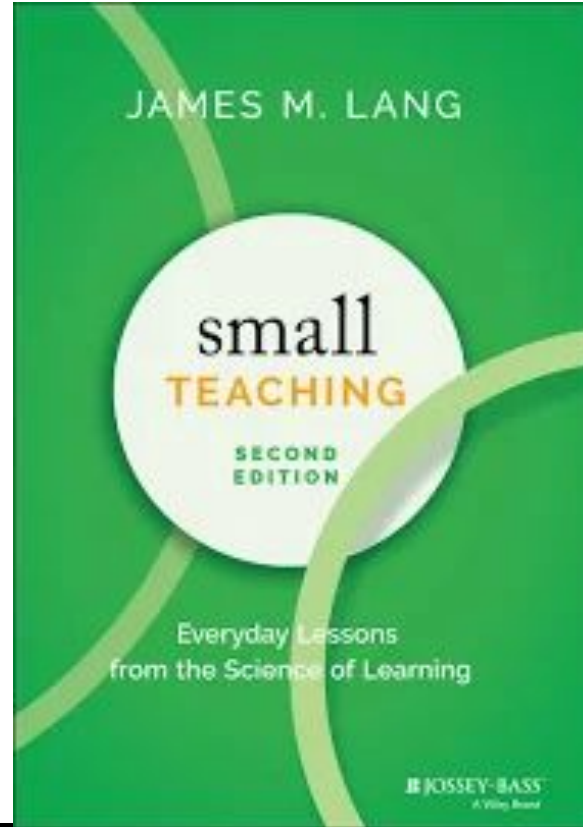
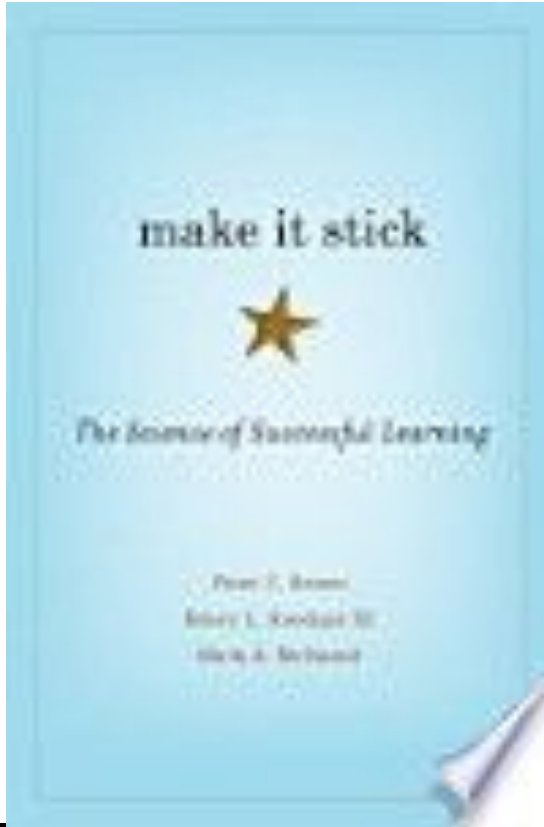


COGNITIVE SCIENCE

Cognitive science is the study of the human mind and brain, focusing on how the mind represents and manipulates knowledge and how mental representations and processes are realized in the brain. –Johns Hopkins University



What Sparked My Interest in This Topic



Desirable Difficulties

“desirable difficulties (Bjork, 1994) include varying the conditions of learning, rather than keeping them constant and predictable”

“desirable difficulties...are desirable because they trigger encoding and retrieval processes that support learning, comprehension, and remembering. If, however, the learner does not have the background knowledge or skills to respond to them successfully, they become undesirable difficulties.”

Bjork, R. A. (2017). Creating desirable difficulties to enhance learning. *Carmarthen: Crown House Publishing*.

Examples of Desirable Difficulties

Interleaving

INTERLEAVING

Interleaving is the concept of alternating between concepts during learning instead of practicing one skill at a time. Studies have shown that interleaving content rather than only presenting information in separate instances throughout a class promotes retention (Richland et al., 2005; Rohrer, 2012).



RESEARCH ON INTERLEAVING

- Sports (Goode & Magill, 1986)
- Medicine (Hatala et al., 2003)
- Art (Kornell & Bjork, 2008)
- Math (Rohrer et al., 2014)

WHY INTERLEAVING WORKS

- Transfer (Shea & Morgan, 1979)
- Similarities and differences (Kang & Pashler, 2011)
- Problem-solving (Rohrer & Taylor, 2007)

ED TECH AND INTERLEAVING

- Online courses make interleaving visible
- Use online discussions (fully online or blended) to interleave content
- Ask questions you used in previous assignments
- Ask fewer questions so students can focus on switching back and forth to different concepts (deeper not wider)
- To help with interleaving between classes, teachers in different grades levels/classes can share content.



Example

Qualitative/Quantitative/Mixed Methods

- Introduce Qualitative
- Discuss Qualitative
- Introduce Quantitative
- Apply Qualitative
- Discuss Quantitative
- Introduce Mixed Methods
- Apply Quantitative
- Discuss Mixed Methods
- Apply Mixed Methods

Online Tools

- Reading
- Discussion board
- Reading
- Assignment
- Discussion board
- Reading
- Assignment
- Discussion board
- Assignment



Example

- Introduce qualitative methods → reading and video lecture
- Discuss qualitative methods → discussion board
- Introduce quantitative methods → reading and video lecture
- Apply qualitative methods to a research scenario → assignment
- Discuss quantitative methods → discussion board
- Introduce mixed methods → reading and video lecture
- Apply quantitative methods to a research scenario → assignment
- Discuss mixed methods → discussion board
- Apply mixed methods to a research scenario → assignment



How can you interleave content?



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Spacing

SPACING

“The spacing effect refers to the finding that long-term memory is enhanced when learning events are spaced apart in time, rather than massed in immediate succession (see [Ebbinghaus, 1885/1964](#), for the first study on the spacing effect)” (Vlach & Sandhofer, 2013, para, 2).



ED TECH AND SPACING

- Educational technology can help us with spacing.
 - Schedule topics to be spaced in advance
 - Schedule reminders/notifications about topics
 - Use tools to track progress and give positive reinforcement
 - Set timers for study



How Can You Implement Spacing?

Retrieval Practice

RETRIEVAL PRACTICE

“Retrieval practice is a strategy in which bringing information to mind enhances and boosts learning. Deliberately recalling information forces us to pull our knowledge “out” and examine what we know” (Argawal, 2021, para. 5).



Research on Retrieval Practice

- Being asked to recall information increases students scores (McDaniel, Agarwal, Huelser, McDermott, & Roediger, 2011)

Successive Relearning

“Successive relearning is a combination of engaging in retrieval practice **multiple** times, while also **spacing** those retrievals out over time”

–(Agarwal, 2021)



ED TECH AND RETRIEVAL PRACTICE

- Quizzing tools
 - Feature where students must correctly answer a question twice
- Flash cards
- Video discussions where students have to explain a concept
- Online peer teaching activities

Key: Use technology to in a way that asks students to retrieve information they learned previously.

Tip: “Provide low-stakes retrieval every few days, not all at once”
(Agarwal, 2021)

How Can You Use Retrieval Practice?



WHY THIS MATTERS?

- It's fascinating!
- Educational technology needs to be used for learning.
- These are some areas educational technology is really good at:
 - Saving content
 - Reusing content
 - Gathering data
 - Setting reminders



Your Ideas?

What ideas do you have for using educational technology for interleaving, spacing, or retrieval practice?



Other Examples of Desirable Difficulties

- Interference
- Deliberative practice
- Variation (how and where learning occurs)

Questions?

REFERENCES

- Agarwal, P. (2021). Retrieval practice. <https://www.retrievalpractice.org/why-it-works>
- Goode, S., & Magill, R. A. (1986). Contextual interference effects in learning three badminton serves. *Research quarterly for exercise and sport*, 57(4), 308-314.
- Hatala, R. M., Brooks, L. R., & Norman, G. R. (2003). Practice makes perfect: the critical role of mixed practice in the acquisition of ECG interpretation skills. *Advances in Health Sciences Education*, 8(1), 17-26.
- Johns Hopkins University. (2022). Cognitive science. <https://cogsci.jhu.edu/about/>
- Kornell, N., & Bjork, R. A. (2008). Learning concepts and categories: Is spacing the “enemy of induction”? *Psychological science*, 19(6), 585-592.
- Rawson, K. A., Dunlosky, J., & Sciartelli, S. M. (2013). The power of successive relearning: Improving performance on course exams and long-term retention. *Educational Psychology Review*, 25(4), 523-548.
- McDaniel, M. A., Agarwal, P. K., Huelser, B. J., McDermott, K. B., & Roediger III, H. L. (2011). Test-enhanced learning in a middle school science classroom: The effects of quiz frequency and placement. *Journal of Educational Psychology*, 103(2), 399.



REFERENCES

- Richland, L. E., Bjork, R. A., Finley, J. R., & Linn, M. C. (2005). Linking cognitive science to education: Generation and interleaving effects. In *Proceedings of the twenty-seventh annual conference of the Cognitive Science Society* (Vol. 27, pp. 1850-55).
- Roediger, H. L., McDaniel, M. A., & Brown, P. C. (2014). *Make it stick: The science of successful learning*. Belknap Press.
- Rohrer, D. (2012). Interleaving helps students distinguish among similar concepts. *Educational Psychology Review, 24*(3), 355-367.
- Rohrer, D., Dedrick, R. F., & Burgess, K. (2014). The benefit of interleaved mathematics practice is not limited to superficially similar kinds of problems. *Psychonomic Bulletin & Review, 21*(5), 1323-1330.
- Vlach, H. A., & Sandhofer, C. M. (2012). Distributing learning over time: The spacing effect in children's acquisition and generalization of science concepts. *Child development, 83*(4), 1137-1144.

