

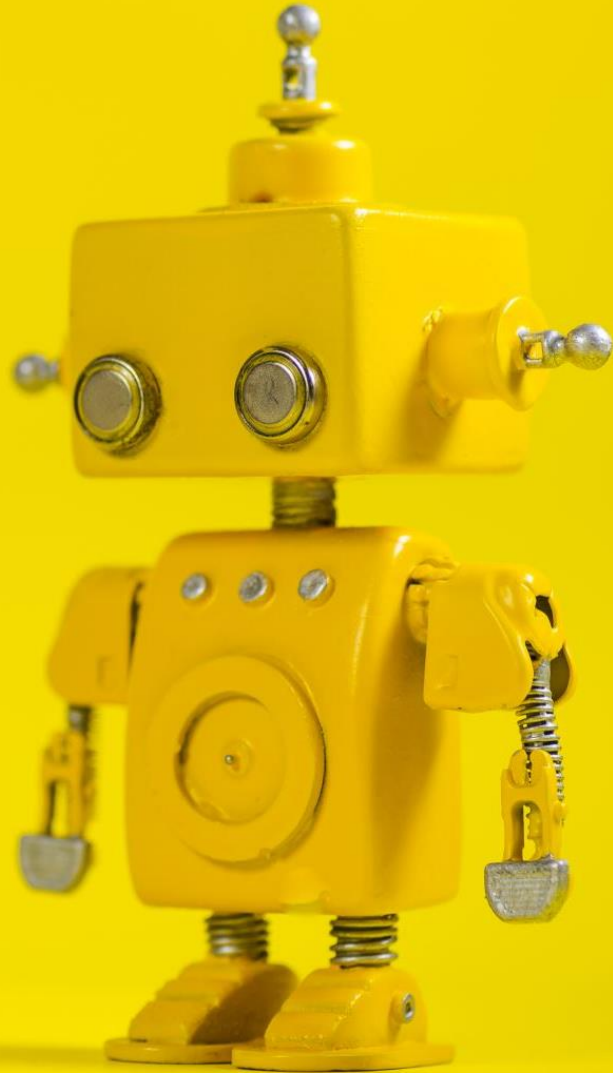
Using Regenerative Artificial Intelligence to Aid Classroom Retention

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Selected Paper

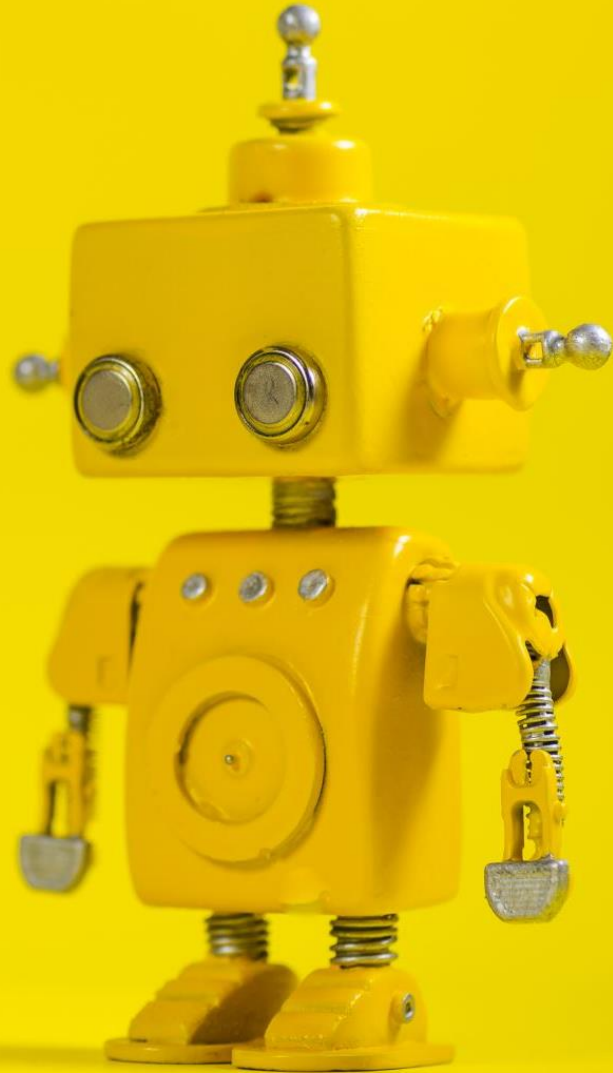
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Overview of AI

- Rise of regenerative artificial intelligence (AI) tools such as chatbots
- Regenerative AI: Friend or foe?
- Student use inside and outside the classroom



Overview of AI

- Tool for greater understanding of material
- Does using an AI tool aid students' knowledge retention?
- Is the use of regenerative AI important to students' future careers?

Technology in Education



Technology incorporation into teaching has long been a teaching process to assist in preparing students for their future careers (Higgins and Moseley, 2001; AACSB, 2020; Ali, 2003)




New technologies should aid student learning, not replace teaching methods (Gardner, 1998; Butler and Sellborn, 2002)

Recent Research

- Ethical concerns for AI in educational settings (AlAfnan et. al, 2023)
- Ethical concerns in industry (Kumar et al., 2021; Carvalho and Ivanov, 2023; Prieto et al., 2023)
- Student willingness to adopt a new technology based on social influences, perceptions of ease of use, and behavioral intention of use (VanDerSchaaf et al., 2021; Davis, 1989)

Research Objectives

- To establish a baseline of students' experience with and feelings about AI
 - To train students in the appropriate use of AI in an educational setting
 - To evaluate students' experiences with this new technology and any differences in learning outcomes
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Methods

- Participants were undergraduate students in various agricultural disciplines at the University of Tennessee at Martin
- Pre-assignment survey assessing student perception of regenerative AI

Methods

- Introductory video on how to use a regenerative AI to research a question
- Course-specific assignments using an AI tool of the students' choosing
- Post-assignment survey





Results

- 185 students completed the pre- and post-evaluation in 8 different courses (5 instructors)
 - 4 general studies courses
 - agricultural policy
 - introductory agricultural engineering technology
 - agribusiness management
 - applied animal reproduction
- Over 83% used ChatGPT to complete the assignment



Key Questions Posed on Pre-Evaluation

Question	Mean (5-point Likert scale)	Standard Deviation
I am familiar with the latest advancements in artificial intelligence (AI) that enable users to seek information from AI systems.	3.297	1.153
I am familiar with chatbots and AI including ChatGPT.	3.238	1.210
I have used AI (e.g. ChatGPT, Bard) to assist with improving papers I've submitted for credit in high school or college classes.	1.778	1.053
Submitting college assignments completely written by AI is ethical.	1.751	0.886
Submitting assignments completely written by AI in a professional business setting is ethical.	1.800	0.902

Key Questions Posed on Post-Evaluation

Question	Mean (5-point Likert scale)	Standard Deviation
The use of this assignment improved my understanding of chatbots/AI.	3.773 ^a	0.861
Using AI helped me retain content more than a traditional lecture.	3.049	0.946
Using AI helped me retain more content than my normal study methods.	3.043	0.977
Using AI in this class resulted in me being more likely to use this technology in the future.	3.297	1.070

^a Indicates significant difference between upper and lower division courses at the 5% level

Key Questions Posed on Post-Evaluation

Question	Mean	Standard Deviation
Did you earn dual enrollment credit while in high school?	0.681	0.467
Do you have a minor?	0.092 ^a	0.290
Did you earn dual enrollment credit while in high school?	0.681	0.467

^a Indicates significant difference between upper and lower division courses at the 5% level

Cross Tabulation of Results

		Submitting college assignments completely written by AI is ethical					
		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Totals
Used AI to improve papers in high school or college	Strongly Disagree	60	26	9	2	0	97
	Disagree	24	23	9	1	0	57
	Neither Agree nor Disagree	1	5	5	0	0	11
	Agree	3	5	4	1	2	15
	Strongly Agree	2	1	1	1	0	5
	Totals	90	60	28	5	2	185

Cross Tabulation of Results

		Submitting assignments completely written by AI in professional settings is ethical					
		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Totals
Used AI to improve papers in high school or college	Strongly Disagree	58	25	11	3	0	97
	Disagree	19	28	8	2	0	57
	Neither Agree nor Disagree	1	6	2	2	0	11
	Agree	4	6	3	1	1	15
	Strongly Agree	1	3	0	0	1	5
	Totals	83	68	24	8	2	185

Cross Tabulation of Results

		Being proficient in using AI will benefit career (Post-Evaluation)					
		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Totals
Being proficient in using AI will benefit career (Pre-Evaluation)	Strongly Disagree						
	Disagree	8	8	43	26	12	97
	Disagree	1	3	23	20	10	57
	Neither Agree nor Disagree	2		2	5	2	11
	Agree	1	5	1	7	1	15
	Strongly Agree						
	Agree		1	2	2		5
Totals		12	17	71	60	25	185

Pre-Training Results

- Students with lower semester GPAs were less likely to state that they used AI in an educational setting
- Female students were less likely to feel that the use of AI in both academic and business settings is ethical
- Students in the lower-division courses were less likely to feel that use of AI in a business setting is ethical



Results

- Comparing the pre- and post-evaluation responses:
 - 44.1% had a more favorable view of how AI proficiency would benefit their career
 - 15.1% had a less favorable view
 - 40.9% did not change their position



Regression Analysis

- We examined what factors impacted the difference between students' perception of the benefits of AI before and after the training and assignment
- Our dependent variable was the difference in students' evaluation of how proficiency in AI would impact their careers

Regression Results

Variable	Model 1		Model 2	
Constant	1.2362***	(0.329)	1.3289	(1.805)
Familiarity with AI technology	0.0446	(0.105)	0.0285	(0.105)
Familiarity with Chatbots	-0.1177	(0.101)	-0.1357	(0.100)
Prior Use of AI in Classroom	-0.1585*	(0.087)	-0.1841**	(0.087)
Feelings about ethics of AI in education	0.0678	(0.127)	0.0079	(0.128)
Feelings about ethics of AI in business	-0.2200*	(0.119)	-0.2241*	(0.121)
Age			0.0569	(0.079)
Term GPA			-0.2926**	(0.126)
Female			-0.2551	(0.171)
Lower-Division Course Dummy			0.1830	(0.238)
Number of Observations	186		186	
F stat	2.64		2.52	
R-squared	0.0683		0.1142	



Discussion

- Only 2 statements were significantly different between upper and lower division courses at the 5% level of significance
 - being proficient in AI will benefit my future career on the pre-evaluation survey
 - the use of this assignment improved my understanding of chatbots/AI
- Controlling for other factors, the number of days students ruminated on their experience with AI and the training did not significantly impact their responses

Questions?



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