

# THE IMPACT OF CHATBOT USE ON SELF-REGULATED LEARNING AND COGNITIVE LOAD

## OBJECTIVES

### PEDAGOGICAL

- Create a Virtual Tutor (ChatBot) to:
- Manage diverse learning needs
  - Facilitate personalised learning
  - Enhance the efficiency of learning
  - Improve content engagement
  - Reduce content uncertainty

### RESEARCH

- Analyse the impact of chatbot use on:
- Self-Regulated Learning (SRL)
  - Cognitive Load (CL)

## PRELIMINARY RESULTS

*“I found it useful as its explanations were directly specific to the content being assessed which was an advantage over other options such as Chatgpt.”*

### GENERAL OBSERVATIONS

- Frequency of interaction with StatBot has positive association with final exam and course marks
- Increased engagement with StatBot was associated with higher perceived quality of learning
- Females were more likely to use StatBot than males
- International students perceived StatBot to be a useful learning resource to support their engagement and satisfaction with the course

	Number with Available Data	Marginal Mean Difference (95% CI)	p-value
Final Exam Mark (DV)			
Bot engagement (all time period)	814	0.031 (0.010 to 0.051)	0.003
Final Subject Mark (DV)			
Bot engagement (all time period)	855	0.040 (0.004 to 0.075)	0.030

### COGNITIVE LOAD

- Results from our randomised control trial suggest that students who used StatBot could reduce CL compared to those who did not

Unadjusted Mean Score (SD)		Mean Difference (95% CI): Chatbot – No ChatBot	p-value
No ChatBot	ChatBot		
27.61 (3.78); N = 347	26.60 (4.05); N = 263	-1.010 (-1.893 to -0.126)	0.026

### SELF-REGULATED LEARNING

- SRL has a positive impact on SLO
- Use of the guided pathway improved SRL compared to the self-guided pathway
- There is a positive relationship between BUL and SRL

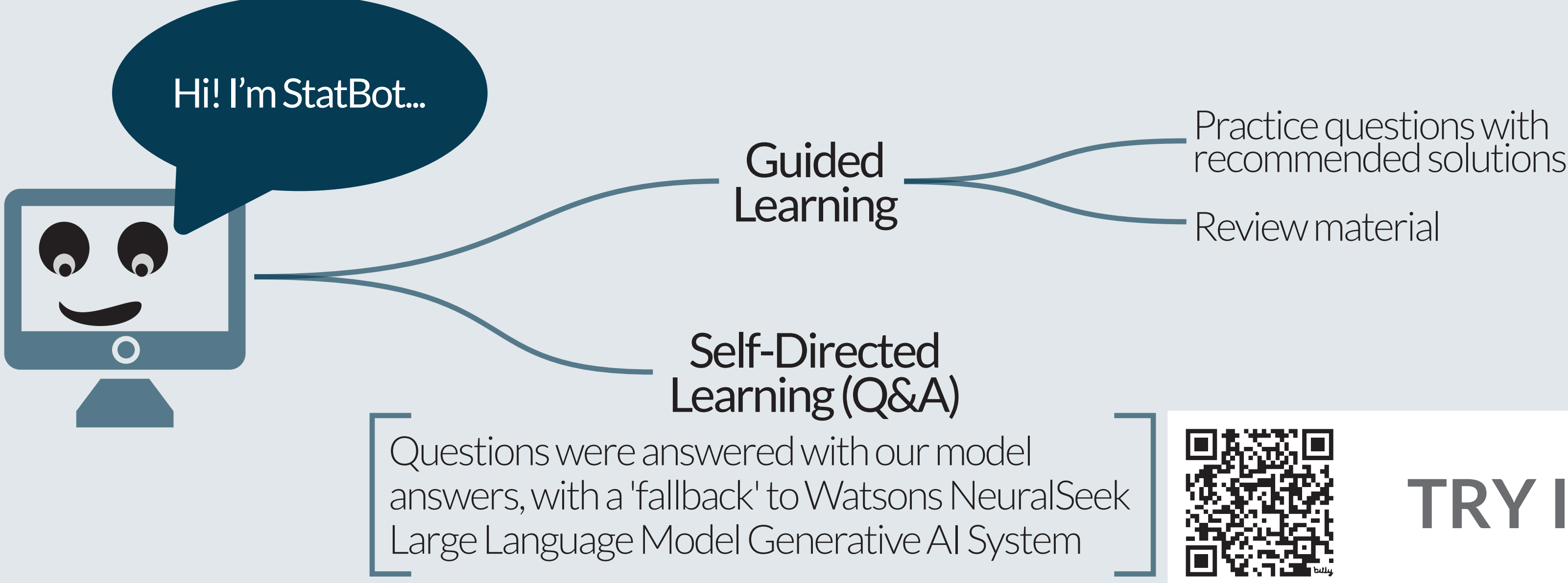
### IMPACT IN A NUTSHELL

Higher engagement with StatBot had a significant positive impact on student learning outcomes and their learning experience

## DESIGN

### A CHATBOT, CALLED STATBOT

- Built on the IBM Watson system, integrated with the Learning Management System (LMS)
- Business and Economics students enrolled within two statistics courses were given the opportunity to engage with StatBot
- StatBot was trained on, and referenced course-specific materials
- Two pathways for enhanced learning



## DISCUSSION

*“I think it is a great experience to learn with statbot.”*  
*“It helped me understand the statistical methods step by step for questions I had”*

### MAIN DISCUSSION

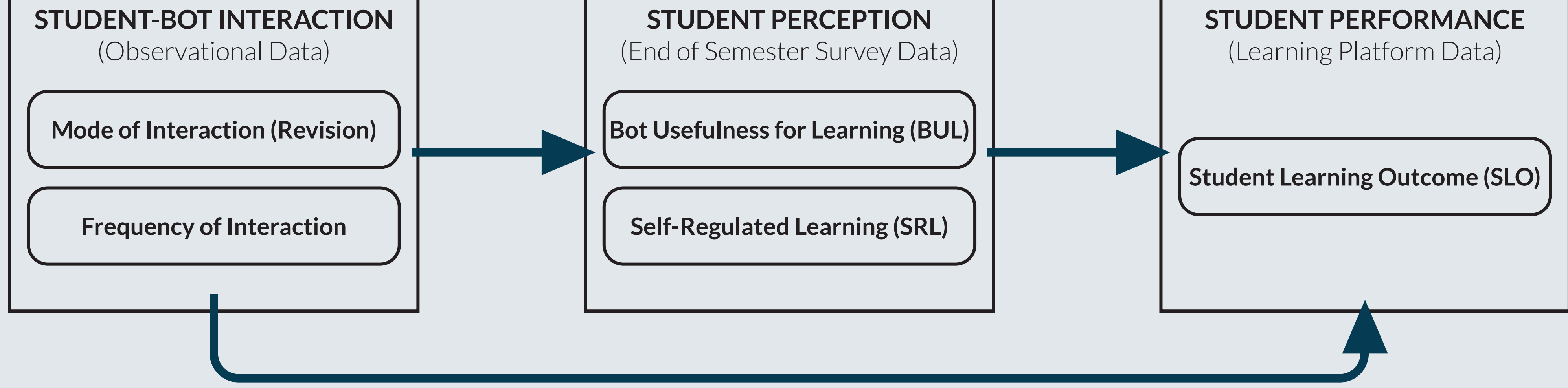
Educational chatbots have potential to enhance learning experiences and learning outcomes through:

- Learning effectively
- Reducing cognitive load
- Better preparing for assessment

### CHALLENGES / NEXT STEPS

- Managing costs
- Improving the quality of questions and responses, and the general user experience
- Keep up to date with a rapidly evolving area
- Encouraging low performing students’ usage

## RESEARCH



This framework focuses on SRL analysis only

### RESEARCH TEAM CONTACT

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