

# Engaging Learnersourcing with an AI Social Agent in Online Learning



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Georgia Tech



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Georgia Tech

# Engaging students in voluntary learnersourcing activities is challenging



A screenshot of a web browser displaying a learning analytics interface from the RIPPLE Institute for Teaching. The URL is <https://itali.uq.edu.au/digital-learning/learning-analytics/ripple>. The page shows a math problem: "Calculate the volume of the following pyramid?" with a diagram of a triangular pyramid. The base is a right-angled triangle with legs of 9 m and 7 m, and a height of 11 m. Below the diagram are four multiple-choice options:

- A.  $693 \text{ m}^3$
- B.  $231 \text{ m}^3$
- C.  $115.5 \text{ m}^3$
- D.  $346.5 \text{ m}^3$

A "SUBMIT ANSWER" button is visible at the bottom of the form. A hand cursor icon is positioned over the "SUBMIT ANSWER" button.

# Related Work – Strategies to motivate student participation

Procrastination and bad time management are common problems stopping students from achieving great results

Solving another problem will help you to:

- train your brain to become better at programming problems
- see how to apply programming to real-life contexts

Solve another problem right now

Skip

Text prompt to emphasize the potential benefits  
(Musabirov et al., 2022)

1		Carol		1155	2	0%	12
2		Issac		1155	4	47%	15
3		Deanna		1145	1	80%	13
4		Kevin		1080	4	0%	14
5		William		1076	6	55%	13
6		Vinnie		1059	3	0%	12
7		Emma		1045	3	0%	11
8		Albie		1043	1	50%	13

## ★ Best MCQ Award - Highest MCQ Effectiveness

	Mark Backstrom	MCQ effectiveness: 85%		Deanna Turner	MCQ effectiveness: 80%		Will	MCQ
	Harry Benton	MCQ effectiveness: 80%		Isaac Weeks	MCQ effectiveness: 78%			

Gamification (leaderboards and badges) features of Ripple  
(Ripple, 2024)

# **Can Building Social Connections Enhance Both Intrinsic and Extrinsic Learnersourcing Motivation?**

# SAMI

- **SAMI (Social Agent Mediated Interaction)**: an AI social agent to facilitate the building of social connections.
- **AI-mediated social interaction**: the AI-facilitated process of building and maintaining social connections between individuals through information inferred from people's online posts (Wang et al., 2022).



Semester	Course	Discussion Forum	# Students
Summer 2023	Human-Computer Interaction	Ed Discussion	385
Summer 2023	Knowledge-Based AI	Ed Discussion	216
Summer 2023	Introduction to Cognitive Science	Slack	115
Fall 2023	Human-Computer Interaction	Ed Discussion	691
Fall 2023	Knowledge-Based AI	Slack	482
Spring 2024	Knowledge-Based AI	Ed Disucssion	517
Spring 2024	Machine Learning for Trading	Ed Discussion	1280

# SAMI Versions and Functionalities

## Current Version

SAMI suggests potential social connections based on shared identities extracted from self-introduction posts.

The screenshot shows the SAMI Sandbox - Ed Discussion interface. At the top, there's a purple header with the title "ed SAMI Sandbox – Ed Discussion". Below the header, there's a search bar and a date filter set to "Jun 1, 2024". A blue button labeled "New Thread" is visible. The main content area displays several threads:

- A thread titled "Introduce Yourself to SAMI" by "General" (Sami Dilab, STAFF, 1y) dated "Feb 26, 2024". It has 9 new replies and 1 like.
- A thread titled "Class Statistics from Your Introduction Thread!" by "Social" (Sami Dilab, STAFF, 1y) dated "Feb 5, 2024". It has 7 replies.
- A thread titled "Class Statistics from Your Introduction Thread!" by "Social" (Sami Dilab, STAFF, 1y) dated "Sep 18, 2023".

On the right side of the interface, there's a sidebar with user profiles and a "SPOTLIGHT BLOCK" section. The sidebar includes icons for messaging, home, notifications (with 3 notifications), and a profile icon for "J". The "SPOTLIGHT BLOCK" section highlights a user named Sophia K. (1d) who introduced herself and another user, Sami Dilab (STAFF, 1d) who responded. It also features a "SPOTLIGHT BLOCK" for users Alex K. and Eric Z., both of whom share an interest in hiking.

## Future Version

# SAMI Versions and Functionalities

Current Version

Future Version

SAMI suggests potential social connections based on shared identities extracted from **all content** that students post in the class discussion forum.

**Sophia K.** 1d  
I just found this article on learnersourcing that looks very interesting. Thought I'd share with all of you.

1 Reply ...

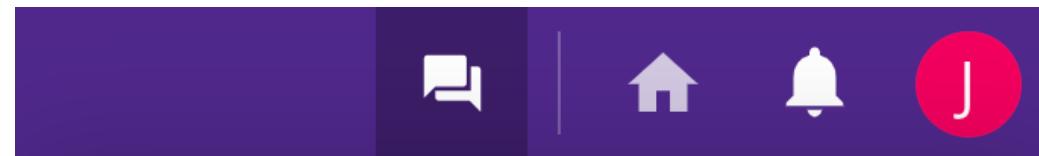
**Sami Dilab** STAFF 1d  
Hello! I noticed that you are interested in learnersourcing. These are the students who are also interested in learnersourcing. You may be interested in connecting with them!

# SAMI Versions and Functionalities

Current Version

Future Version

SAMI sends a notification of a connected student's activity.



Apr 19, 2024

K Your connection **Kelly** posted a new update.  
View the updated post: [Articles on Learnersourcing](#)  
Inspired to share your own insights?  
[Create your post](#)

CS 8803 HAI • 2mth

# Envision of SAMI Supporting Learnersourcing Activities

## Integration of SAMI into Existing Learnersourcing Platforms

I'm Looking for:  
A study partner, Support  
Languages: English, French  
Times: Monday: Morning, Afternoon...  
Page size: 10 | 1-4 of 4 < >

**Deanna Turner** Looking for a study partner  
1st year student majoring in Physics and Maths. Also into gaming.  
CONNECT WITH DEANNA

**Carol Melia** Looking for a study partner  
Just looking for a partner for the assignment  
CONNECT WITH CAROL

**tirell arzu** Looking for a study partner  
Maths nerd ready to ace this course.  
CONNECT WITH TIRELL

Ripple's Study groups feature

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Ripple's gamification (leaderboards and badges) features

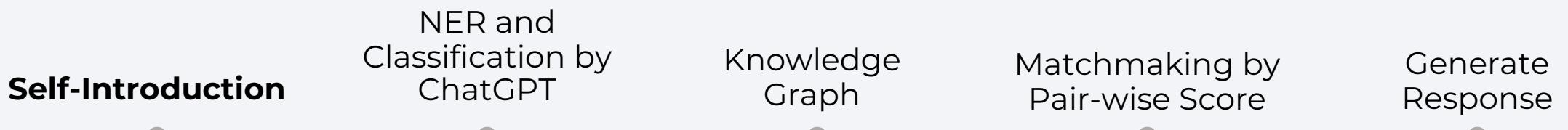
# Envision of SAMI Supporting Learnersourcing Activities

Building Initial  
Social Connections

Maintaining  
Social Connections

Expanding  
Social Connections

SAMI suggests potential social connections based on shared identities extracted from self-introduction posts.



**Jisu**

**Looking for a study partner**

I live in Atlanta. I am pursuing the ML specialization and taking HCI. In my free time, I like to work out, cook and hiking.

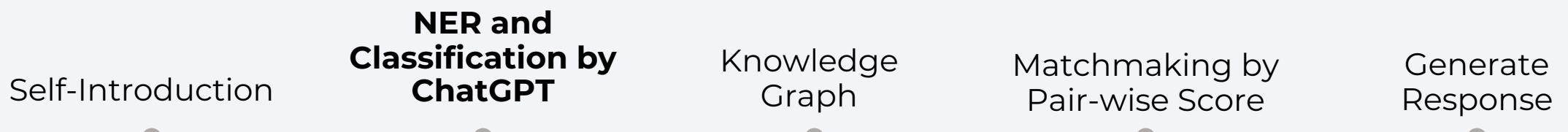
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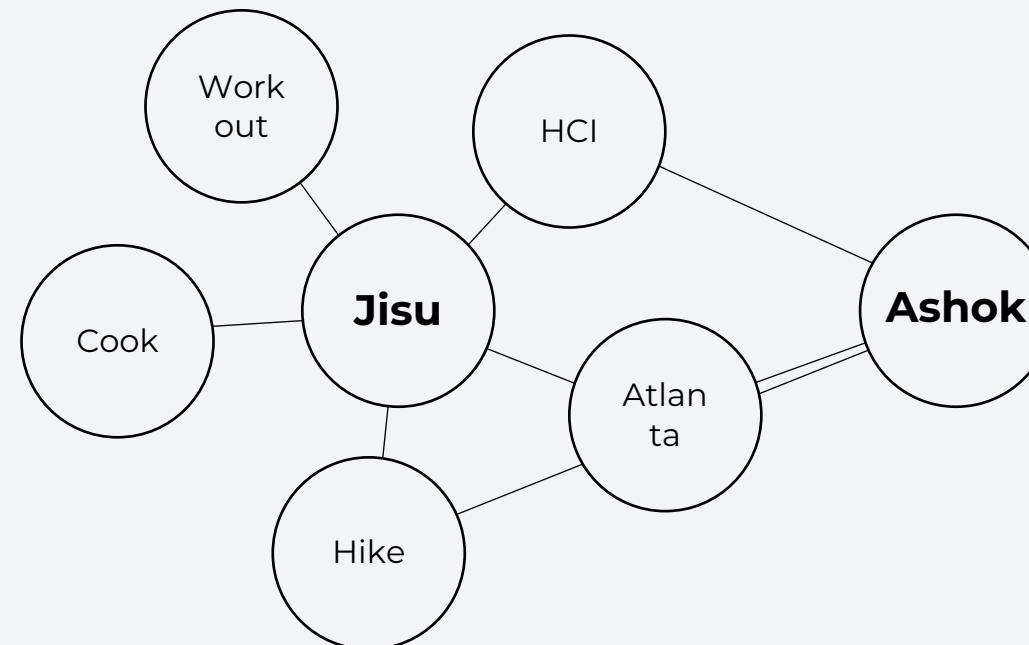
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Self-Introduction                    NER and Classification by ChatGPT                    Knowledge Graph                    Matchmaking by Pair-wise Score                    Generate Response

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Maintaining Social Connections

Expanding Social Connections

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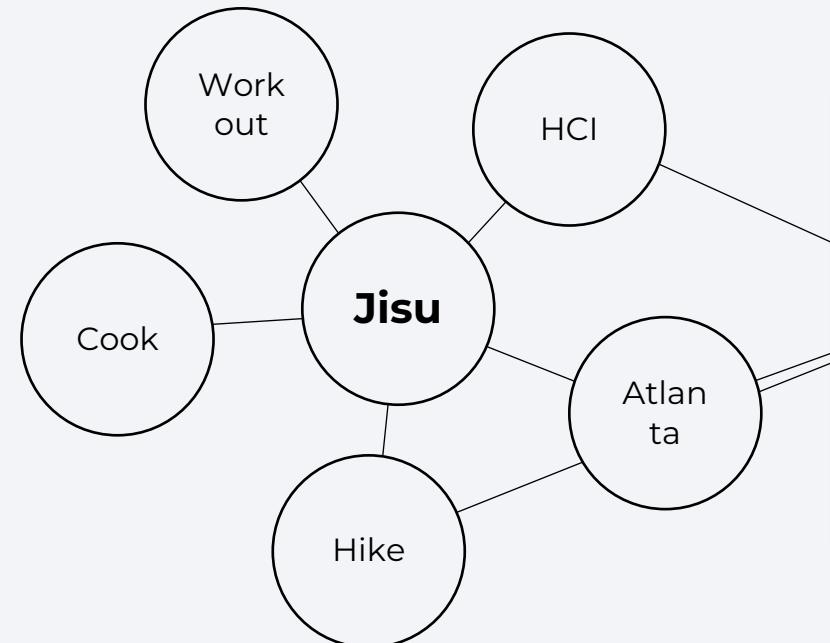
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**Ashok**  
**Jisu, meet Ashok**

He too lives in Atlanta and likes hiking. His specialization is ML and also taking HCI. ...

**Connect with Ashok**

# Envision of SAMI Supporting Learnersourcing Activities

Building Initial  
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SAMI sends a notification of a connected student's activity.



**Your connection Ashok  
created a new multiple  
choice question.**

Want to check the question? [View  
the question](#)

Inspired to create your own  
question?  
[Create your question](#)

# Envision of SAMI Supporting Learnersourcing Activities

Building Initial  
Social Connections

Maintaining  
Social Connections

Expanding  
Social Connections

SAMI suggests potential social connections based on shared identities extracted from **all activities** of students.



**I have a new social  
connection suggestion based  
on your interests.**

You have shown engagement in  
activities related to Korea's  
contemporary history.  
Hyoungwook also shares this  
interest.

# Expectations of SAMI

- **RQ1:** Does AI-mediated social interaction enhance online students' **intrinsic** motivation to participate in learnersourcing activities?
- **H1:** SAMI will lead to enhanced intrinsic motivation among learners by fostering autonomy, competence, and relatedness .



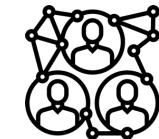
## Autonomy

Grades and gamification use extrinsic motivation mechanisms but might reduce the student's autonomy and harm intrinsic motivation (Denny et al., 2018).



## Competence

Recognition provides people with positive information about their self-competence (Deci et al., 2000).



## Relatedness

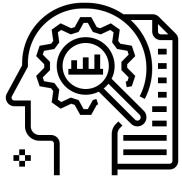
Students using SAMI report higher social belongingness ( $t$ -test  $p$ -value = 0.002,  $n=601$ ).

*"I think the personalized response fosters inclusion and collaboration in the class. It helped me have a sense of belonging (Kakar et al., 2024)."*

# Expectations of SAMI

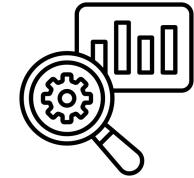
- **RQ2:** Does AI-mediated social interaction enhance online students' **extrinsic** motivation to participate in learnersourcing activities?
- **H2:** SAMI will lead to enhanced extrinsic motivation among learners by recognition through notifications. The delivery of recognition can activate extrinsic motivation (Hansen et al., 2022)
- **RQ3:** Does AI-mediated social interaction enhance online students' motivation to participate in learnersourcing activities?
- **H3:** Higher intrinsic and extrinsic motivation will lead to enhanced motivation of learnersourcing activities.

# Future Plan



## Qualitative Analysis

Semi-structured interviews



## Quantitative Analysis

Quasi-experimental design

	Human-Computer Interaction	Knowledge-Based AI
Spring 2024	-	SAMI
Fall 2024	SAMI	-



# Engaging Learnersourcing with an AI Social Agent in Online Learning

## Happy to Chat!

I am open to collaboration and research opportunities and am applying for a PhD!



[jisulog.kim](http://jisulog.kim) Try out my virtual assistant!



[jisu.kim@gatech.edu](mailto:jisu.kim@gatech.edu)

