JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

ARTIFICIAL INTELLIGENCE AND SELF-REGULATED LEARNING IN OUTCOME-BASED EDUCATION: UNDERGRADUATE STUDENTS' PERCEPTIONS

Fariha Siddique[1], Dr. Almas Shoaib[*2]

[1]*MPhil ELM, University of Management and Technology, Lahore, Punjab, Pakistan*
[*2]*Assistant Professor (Corresponding Author), University of Management and Technology, Lahore, Punjab, Pakistan*

[1]f2024262013@umt.edu.pk, [*2]almas.shoaib@umt.edu.pk

DOI: https://doi.org/10.5281/zenodo.21867348

Keywords
artificial intelligence, self-regulated learning, outcome-based education, Technology Acceptance Model, undergraduate students, learning engagement

Article History

Received: 28 April 2026
Accepted: 15 June 2026
Published: 30 June 2026

Copyright @Author
Corresponding Author: *
Dr. Almas Shoaib

Abstract

Artificial intelligence (AI) has become an increasingly important tool for supporting undergraduate learning through concept explanation, feedback, assessment, and self-regulated learning (SRL). However, limited empirical research has examined students' perceptions of AI as a support mechanism for SRL within outcome-based education (OBE), particularly across demographic and academic groups. Guided by self-regulated learning theory, the Technology Acceptance Model, and constructive alignment, this study investigated the relationships among perceived usefulness, perceived ease of use, trust in AI feedback, ethical concerns, perceived OBE alignment, AI-supported SRL, learning engagement, and behavioral intention to use AI. A quantitative cross-sectional survey was conducted with 320 undergraduate students. Data were analyzed using descriptive statistics, reliability analysis, Pearson correlation, multiple regression, independent-samples t tests, one-way analysis of variance (ANOVA), and mediation analysis. The findings indicated that students generally held positive perceptions of AI and reported moderate to high levels of AI-supported SRL, learning engagement, and intention to use AI. Perceived usefulness, ease of use, trust in AI, perceived OBE alignment, AI use frequency, and OBE awareness significantly predicted AI-supported SRL. Significant differences in AI-supported SRL were observed across AI use frequency, previous AI training, OBE awareness, and year of study. Furthermore, positive perceptions of AI significantly mediated the relationship between AI-supported SRL and learning engagement. The findings suggest that AI can effectively enhance undergraduate students' self-regulated learning within an OBE framework when implemented with appropriate ethical safeguards, AI literacy, and transparent assessment practices.

1. INTRODUCTION

Outcome-based education (OBE) can be seen as one of the most important quality-control systems in higher education as it is expected to have alignment of curriculum, pedagogy, and assessment with explicit learning outcomes and

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

competences (Biggs, 1996; Spady, 1994). In the OBE system, it is expected that the undergraduate students know the learning outcomes of the course, track their own learning and demonstrate their competency through these assessment tasks. The importance of self-regulated learning (SRL) comes from these requirements: SRL is defined as goal setting, planning, monitoring, seeking help, reflecting on learning, and adjusting learning behavior (Pintrich, 2000; Zimmerman, 2002).

Generative AI and learning analytics have quickly become a part of the teaching and learning landscape, providing explanations, formative assessments, personalized prompts, study-planning support and reflective questioning. The recent research states that the students perceive Generative AI tools as beneficial for learning support, brainstorming, writing support, concept clarification & feedback, but are also concerned about accuracy, dependency, privacy, bias, and academic integrity (Chan & Hu, 2023; Kasneci et al., 2023; UNESCO, 2023). One of the most under-researched aspects of using AI in higher education is that it still lacks a strong connection with specific pedagogical frameworks (Crompton & Burke, 2023; Zawacki-Richter et al., 2019); it is mostly treated like a technical assistant rather than a pedagogically guided learning support system.

In the context of OBE, the use of AI will be educationally significant if it helps build understanding of learning outcomes, plan learning strategies, assess against rubrics, request feedback and reflect on the gap in skills. Using AI to find only the final answer can lead to the erosion of authentic assessments and critical thinking, as well. However, AI can be applied to support students' SRL and enhance their experiences of interacting with OBL tasks in terms of goal clarification, self-monitoring of actions, interpretation of feedback, and further reflection and improvement.

A second aspect of concern is whether the levels of AI perception of students vary in terms of their demographic and academic background, including gender, study year, study field, whether they have been trained in AI, how often they use AI, and AI awareness in the context of OBE. Even more important are the distinctions because, if all undergraduate students are assumed to be equal in terms of access, confidence, background in OBE, training etc., this is insufficient to effectively design responsible integration of AI. Thus, comparing groups:'équipe differences provides clues to universities about student groups that might have a need for further AI literacy support, further OBE orientation or structured guidance regarding the ethical and self-regulated use of AI.

In this regard, the present study examines student perceptions of the usefulness of AI, ease of use of AI, trust in AI, AI ethical concern, and OBE Alignment; student perceptions of AI to support SRL; the association of AI-supported SRL and learning engagement and intention to adopt AI; demographic and academic differences in AI-supported SRL; and any mediation effect between AI-positive perceptions and learning engagement. Their study has three contributions: they combined AI perception, SRL and OBE into one empirical model, they tested their hypotheses with the survey data including some pattern of the demographic differences, and finally, they provided practical recommendations for using AI responsibly in OBE at the undergraduate level.

1.1 Research Objectives

The study was based on the following objectives, to:

- Examine undergraduate students' perceptions of AI usefulness, ease of use, trust, ethical concern, and OBE alignment.
- Assess the level of AI-supported self-regulated learning among undergraduate students.
- Determine the relationship between AI-related perceptions and AI-supported SRL.
- Test whether AI-supported SRL predicts learning engagement and behavioral intention to use AI.
- Examine differences in undergraduate students' perceptions of AI-supported SRL based on demographic and academic variables such as

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

gender, study year, discipline, AI-use frequency, prior AI training, and OBE awareness.

- Examine whether AI-supported SRL mediates the relationship between AI-positive perception and learning engagement.

1.2 Research Questions

- What are undergraduate students' perceptions of AI for learning within OBE?
- To what extent do students perceive AI as supporting SRL processes?
- Which AI-related factors significantly predict AI-supported SRL?
- How does AI-supported SRL relate to learning engagement and adoption intention?
- Do undergraduate students' perceptions of AI-supported SRL differ based on demographic and academic variables?
- Does AI-supported SRL mediate the relationship between AI-positive perception and learning engagement?

2. Literature Review and Hypotheses

2.1 Artificial Intelligence in Higher Education

It defines what it means in relation to higher education and its application of computation tools/systems for teaching and learning, assessment, feedback, analytics and support for the learner. Chatbots are becoming a go-to tool for students to assist with writing, summarizing, coding, assessment preparation, study plans and explanations, amongst other tasks, due to the recent surge of generative AI. While the amount of use might have grown there are many studies that are vague about their relation to learning theory and pedagogical design in the context of higher education students, as shown in systematic review of the subject area (Crompton & Burke, 2023; Zawacki-Richter et al., 2019). However, although the attitudes found in the studies that rely on students are seemingly generally positive, the ethics of using AI, academic integrity, accuracy, privacy, and dependency have been raised as concerns (Chan & Hu, 2023; Slimi et al., 2025).

2.2 Self-Regulated Learning

Self-regulated learning is an active, pro-active process, which learners engage in to set up learning goals, choose learning strategies, monitor learning process, regulate their motivation and behaviors, and evaluate learning results (Pintrich, 2000; Zimmerman, 2002). Based on his summary of the most reported SRL models, Panadero (2017) pointed out the significance of the cognitive, motivational, emotional and behavioral aspects of regulation. SRL plays a crucial role in AI-supported learning as learners need to evaluate the AI-generated content, decide when to use AI in their learning, verify its accuracy, but also use AI's feedback to improve their learning beyond AI. According to recent debates on AI's function in SRL, AI can serve as a facilitator for students' forethought, performance, and reflection stages in SRL while students take control of their learning process (Lan & Zhou, 2025).

2.3 Outcome-Based Education and Constructive Alignment

OBE is a pedagogy and assessment approach that focuses on students' skills they will demonstrate after their learning experiences (Spady, 1994). Students should then be able to "build meaning" appropriately and learning activities should be relevant to assessment tasks; this requires constructive alignment of intended learning outcomes (ILOs), teaching learning activities and assessment tasks (Biggs, 1996). When considering AI use in the context of OBE, factors include the course learning outcomes, programme learning outcomes, rubrics and the criteria for feedback and assessment integrity. If AI can be useful to students to interpret results, plan for competence, monitor competence evidence and reflect on competence gaps – pedagogically useful.

2.4 Technology Acceptance, Trust, and Ethical Concern

According to technology acceptance theory, perceived usefulness and perceived ease of use will impact on learners' attitudes and behavior

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

intentions to technology (Davis, 1989). In addition to credibility, trust in feedback is also important for AI applications in which the student evaluates the credibility and usefulness of feedback from AI. At the same time, when students perceive they are facing a threat in the form of plagiarism, dependency, misinformation, and/or unfair advantage, the ethical concern is found to dampen their intention to adopt. According to UNESCO 2023, integrating AI in education should be human-centric, transparent, learners should have a safeguard, ensuring that their agency is safeguarded, and there should be responsible policies.

2.5 Demographic and Academic Differences in AI-Supported SRL

Students' SRL using AI can be affected by demographic and academic differences or between individual students due to differences in technological exposure, training opportunities, attitude to disciplinary assessments, and knowledge about OBE. AI-use frequency can boost confidence and proficiency in how AI is used for goal-setting, monitoring, and interpreting feedback, and AI training can help mitigate uncertainty and promote responsible use of AI. In the same way, students who have more awareness of OBE might be more likely to make links between the learning activities supported by AI and course outcomes, assessment criteria and competence expectations. Thus, an analysis of differences among the groups will better guide AI literacy and OBE support, hence avoiding the assumption that every student is equally served by the use of AI.

2.6 Hypotheses

H1: AI-positive perception is positively associated with AI-supported SRL.
H2: Perceived usefulness of AI is positively associated with AI-supported SRL.
H3: Perceived ease of AI use is positively associated with behavioral intention to use AI for SRL.
H4: Trust in AI feedback is positively associated with AI-supported self-monitoring.
H5: Ethical concern is negatively associated with behavioral intention to use AI.
H6: Perceived OBE alignment is positively associated with AI-supported SRL.
H7: AI-supported SRL is positively associated with learning engagement.
H8: AI-supported SRL mediates the relationship between AI-positive perception and learning engagement.
H9: AI-supported SRL differs significantly across selected demographic and academic variables.

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

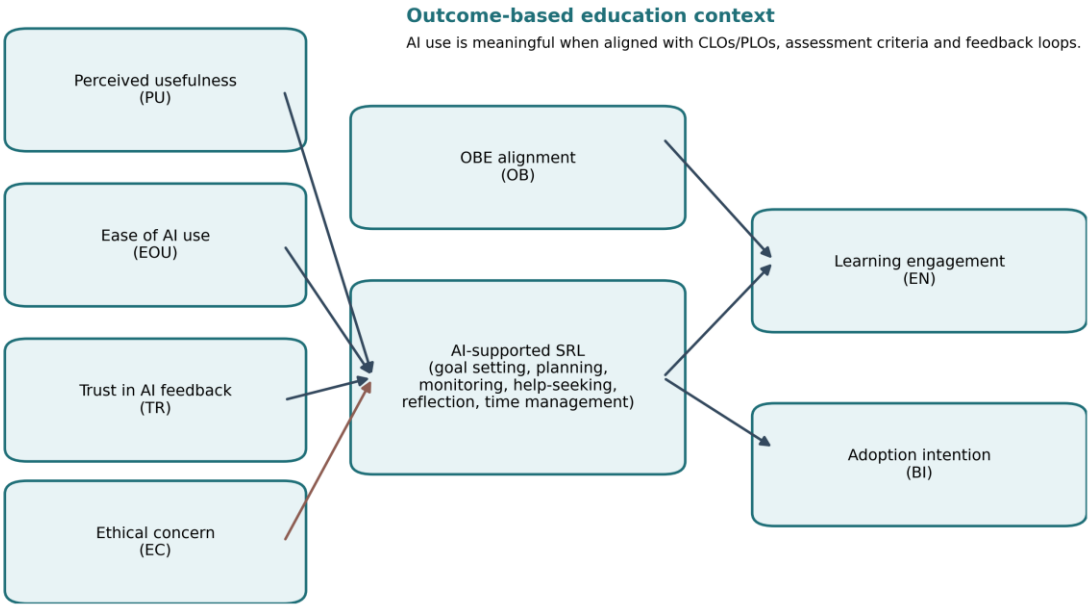

Figure 1. Conceptual framework linking AI perception, OBE alignment, AI-supported SRL, engagement, and adoption intention.

3. Methodology

3.1 Research Design

A quantitative, cross-sectional survey design was adopted. This design was suitable since the aim was to examine the perceptions of undergraduate students, to test the relationships between AI-related factors, SRL support, OBE alignment, engagement, and intention to use, at a single point in time, and to compare and contrast the SRL support with AI between groups of students by demographic and academic demographics.

3.2 Respondent Profile

A total of 320 undergraduate response records were analyzed. Demographic variables were included in the data set, along with AI usage variables, OBE awareness and 51 Likert scale questionnaire items (ranging from 1 = strongly disagree to 5 = strongly agree). The distribution of the demographic is given in Table 1.

Table 1. Demographic and academic profile of response records (N = 320).

Category	*N*	*%*
Gender		
Male	145	45.3
Female	168	52.5
Prefer not to say	7	2.2
Study Year		
First year	74	23.1
Second year	80	25.0
Third year	85	26.6
Fourth year	81	25.3

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

Discipline		
Business	72	22.5
CS/IT	66	20.6
Engineering	51	15.9
Social Sciences	38	11.9
Health Sciences	49	15.3
Arts/Humanities	20	6.2
Education	24	7.5
AI Use Frequency		
Never	21	6.6
Rarely	65	20.3
Monthly	73	22.8
Weekly	89	27.8
Daily	72	22.5
Prior AI Training		
No	209	65.3
Yes	111	34.7
OBE Awareness		
Very low	14	4.4
Low	52	16.2
Moderate	110	34.4
High	102	31.9
Very high	42	13.1

Note. Percentages may not total exactly 100 because of rounding.

The data set contains a representative undergraduate sample spread across study years with females making up 52.5% of the sample. The use of AI was already prevalent, with 50.3% of students using AI weekly or daily and 6.6% reporting they never used AI. The level of OBE awareness was high to moderate, hence the samples were selected right in the sense of studying AI utilization in the outcome oriented learning model.

3.3 Instrument and Measurement

The instrument included the items of perceived usefulness (PU), ease of use (EOU), trust in AI feedback (TR), ethical concern and over-reliance risk (EC), AI-supported SRL dimensions, perceived OBE alignment (OB), learning engagement (EN), and behavioral intention (BI). The composite mean of AI-supported goal setting, strategic planning, self-monitoring, help-seeking, reflection, and time management was used to operationalize the SRL support. The composite mean of PU, EOU, and TR obtained the score of AI-positive perception. Responsible AI readiness was measured on a reverse scale of ECR (6 - EC).

3.4 Data Analysis

Descriptive statistics, Cronbach's alpha, Pearson correlation, multiple regression, independent-samples t-tests, one-way ANOVA and mediation-style path analysis with bootstrapped indirect effects were used for data analysis. Independent-samples t-tests were applied for comparisons between two demographic or academic groups, and the one-way ANOVA for comparisons among three or more groups of the different types. A probability level of .05 was used as criterion for significance level. Commonly used thresholds for interpretation were used to assess reliability: .70 as

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

acceptable, .80 as good, and .90 as excellent (Nunnally & Bernstein, 1994).

3.5 Ethical Considerations

No personal information (names, roll numbers, emails etc.) was included in the dataset analyzed in this version. With the final submission to a journal the authors should include the institutional ethics approval number, consent procedure, data protection statement and a statement that participation was voluntary.

4. Results

4.1 Descriptive Statistics and Reliability

Table 2. Descriptive statistics and internal consistency of study constructs.

Code	*Construct*	*Items*	*Mean*	*SD*	*Alpha*	*Level*
PU	Perceived usefulness of AI	5	3.62	1.00	0.901	Moderate-high
EOU	Perceived ease of AI use	4	4.12	0.86	0.846	Moderate-high
TR	Trust in AI feedback	4	3.67	0.90	0.837	Moderate-high
EC	Ethical concern/over-reliance risk	4	3.30	0.89	0.821	Moderate-low
GS	AI-supported goal setting	4	3.53	0.91	0.820	Moderate-high
PL	AI-supported strategic planning	4	3.70	0.91	0.845	Moderate-high
MO	AI-supported self-monitoring	4	3.62	0.88	0.829	Moderate-high
HS	AI-supported help-seeking	3	3.71	0.93	0.809	Moderate-high
RF	AI-supported reflection	4	3.45	0.91	0.835	Moderate-high
TM	AI-supported time management	3	3.58	0.89	0.777	Moderate-high
OB	Perceived OBE alignment	5	3.53	1.11	0.926	Moderate-high
EN	Learning engagement	4	3.54	0.93	0.847	Moderate-high
BI	Behavioral intention to use AI	3	3.74	1.05	0.842	Moderate-high

JOURNAL FOR SOCIAL SCIENCE

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

SRL	SRL	Composite	3.60	0.59	-	Moderate-high
AI Positive	AI Positive	Composite	3.80	0.76	-	Moderate-high
Responsible AI	Responsible AI	Composite	2.70	0.89	-	Moderate-low
Engagement	Engagement	Composite	3.54	0.93	-	Moderate-high
Adoption	Adoption	Composite	3.74	1.05	-	Moderate-high

Note. Scale: 1 = strongly disagree to 5 = strongly agree. SRL = self-regulated learning; alpha values are Cronbach's alpha coefficients.

The reliability for all multi-item constructs was acceptable to excellent. The mean score (M = 4.12) for Ease of Use was the highest, indicating that students tended to find AI tools easy to use in general. However, responsible AI readiness was relatively low (M = 2.70), indicating that, even though participants rate AI usefulness high and SRL support as positive, there may still be important issues of ethical concern and over-reliance on AI.

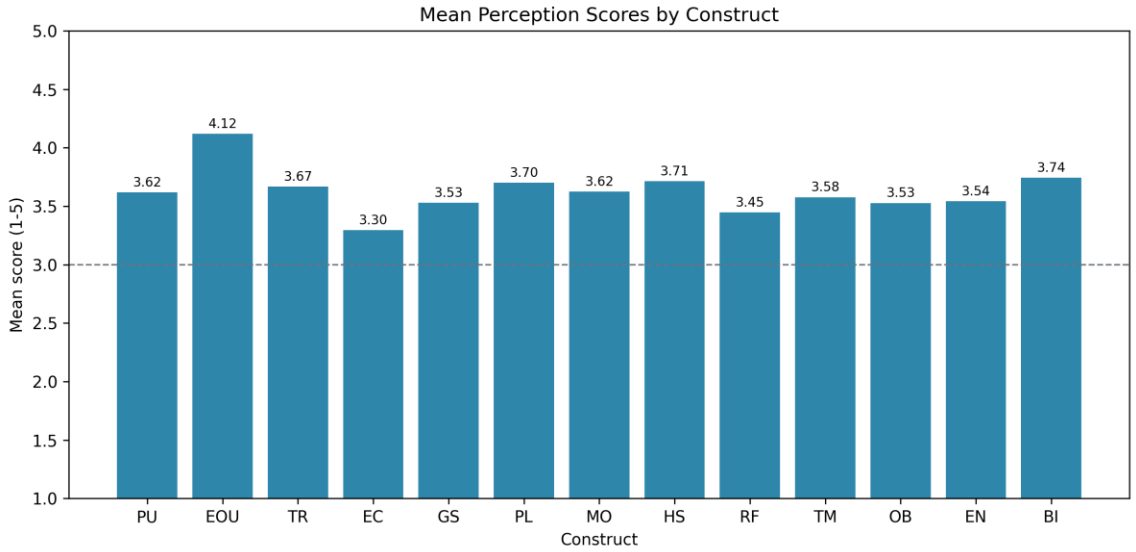

Figure 2. Mean scores of AI perception, SRL, OBE alignment, engagement, and adoption constructs.
Note. Construct means above 3.00 indicate generally positive perceptions.

4.2 Correlation Analysis

Table 3. Pearson correlation matrix of key study variables.

Variable	*PU*	*EOU*	*TR*	*EC*	*OB*	*SRL*	*EN*	*BI*
PU	1							
EOU	0.52***	1						
TR	0.57***	0.49***	1					
EC	-0.18**	-0.22***	-0.24***	1				

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

OB	0.33***	-0.02	0.16**	-0.02	1			
SRL	0.72***	0.55***	0.65***	-0.20***	0.48***	1		
EN	0.59***	0.45***	0.52***	-0.23***	0.28***	0.61***	1	
BI	0.64***	0.52***	0.56***	-0.23***	0.19***	0.58***	0.55***	1

*Note. PU = perceived usefulness; EOU = ease of use; TR = trust; EC = ethical concern; OB = OBE alignment; SRL = AI-supported self-regulated learning; EN = learning engagement; BI = behavioral intention. * p < .05. ** p < .01. *** p < .001.*

AI-positive perception had the most significant correlation with AI-supported SRL (r = .774, p < .001), suggesting that positive perception of AI had a higher possibility of student reporting AI-supported SRL. There was a negative relationship between ethical concern and behavioral intention (r = -0.232, p < .001), reinforcing the need for responsible AI practices to ensure the sustainability of AI adoption.

4.3 Hypothesis Testing

Table 4. Hypothesis testing summary.

Hypothesis	*Path*	*Statistic*	*p / CI*	*Decision*
H1	AI positive perception → AI-supported SRL	0.774	< .001	Supported
H2	Perceived usefulness → AI-supported SRL	0.720	< .001	Supported
H3	Ease of use → behavioral intention	0.521	< .001	Supported
H4	Trust in AI feedback → self-monitoring	0.550	< .001	Supported
H5	Ethical concern → adoption intention	-0.232	< .001	Supported
H6	OBE alignment → AI-supported SRL	0.482	< .001	Supported
H7	AI-supported SRL → learning engagement	0.611	< .001	Supported
H8	AI-positive perception -> SRL -> engagement	ab = .285	95% CI [.169, .400]	Supported
H9	Demographic/academic variables -> SRL	Significant for study year, prior training, OBE awareness, and AI-use frequency	p < .05	Partially supported

Note. Pearson correlations were used for directional hypothesis testing.

There was support for all 7 direct hypotheses along with a significant bootstrapped indirect effect in support of the mediation hypothesis, and there was partial support for the demographic-difference hypothesis. Positive perceptions, usefulness, ease of use, trust and OBE alignment showed a positive relationship with respect to AI-supported SRL or AI adoption, whereas ethical concern had a negative relationship with behavioral intention. The results corroborate the theoretical assumption

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

that students' educational background and learner profile, as well as pedagogical perceived usefulness and concerns about responsible use, influence the use of AI in OBE.

4.4 Regression Analysis Predicting AI-Supported SRL

Table 5. Multiple regression predicting AI-supported self-regulated learning.

Predictor	*B*	*SE*	*Beta*	*t*	*p*
Intercept	0.768	0.146		5.26	< .001
PU	0.154	0.027	0.259	5.63	< .001
EOU	0.159	0.028	0.229	5.69	< .001
TR	0.194	0.025	0.292	7.71	< .001
EC	-0.002	0.020	-0.003	-0.11	.915
OB	0.130	0.023	0.241	5.52	< .001
AI use frequency	**0.046**	**0.021**	**0.095**	**2.21**	**.028**
OBE awareness	**0.091**	**0.024**	**0.158**	**3.75**	**< .001**

Note. Model fit: R2 = 0.726, adjusted R2 = 0.720, F(7, 312) = 118.28, p < .001.

The model explained 72.6% of the variance in AI-supported SRL. The standardized mean effect on trust in AI feedback was the highest, followed by perceived usefulness, OBE alignment, ease of use, OBE awareness, and AI use frequency. When controlling for the other variables, ethical concern did not emerge as a significant predictor, indicating that ethical concern had a more direct influence on adoption as opposed to SRL support itself.

4.5 Regression Analysis Predicting Learning Engagement

Table 6. Multiple regression predicting learning engagement.

Predictor	*B*	*SE*	*Beta*	*t*	*p*
Intercept	0.452	0.313		1.44	.150
AI-supported SRL	0.657	0.093	0.419	7.08	< .001
OBE alignment	0.020	0.041	0.024	0.49	.624
Adoption intention	0.251	0.047	0.283	5.34	< .001
Ethical concern	-0.086	0.046	-0.082	-1.88	.061

Note. Model fit: R2 = 0.437, adjusted R2 = 0.430, F(4, 315) = 61.23, p < .001.

Learning engagement was significantly predicted by AI-supported SRL and intention to adopt. The results showed that although the SRL and adoption intention were not significant, the OBE alignment was not significant also after being controlled, which means that OBE alignment might have an indirect effect by strengthening SRL process and not a direct effect on engagement.

4.6 Group Differences by Demographic and Academic Variables

Table 7. AI-supported SRL by AI use frequency.

AI use frequency	***n***	***Mean SRL***	***SD***	***F***	***p***	***eta squared***
Never	21	3.01	0.52			
Rarely	65	3.30	0.50			

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

Monthly	73	3.42	0.54			
Weekly	89	3.75	0.49			
Daily	72	4.03	0.52			
ANOVA summary				**29.63**	**< .001**	**0.273**

Note. One-way ANOVA tested group differences in AI-supported SRL across AI use frequency groups.

The level of students who used AI daily was the highest in terms of the level of SRL improvement (M = 4.03), which showed a progressive increase from the students who never used AI (M = 3.01).

The ANOVA was significant, F(4, 315) = 29.63, p < .001, eta squared = 0.273, which means that there was a very large practical difference between the amount of SRL support in different AI uses.

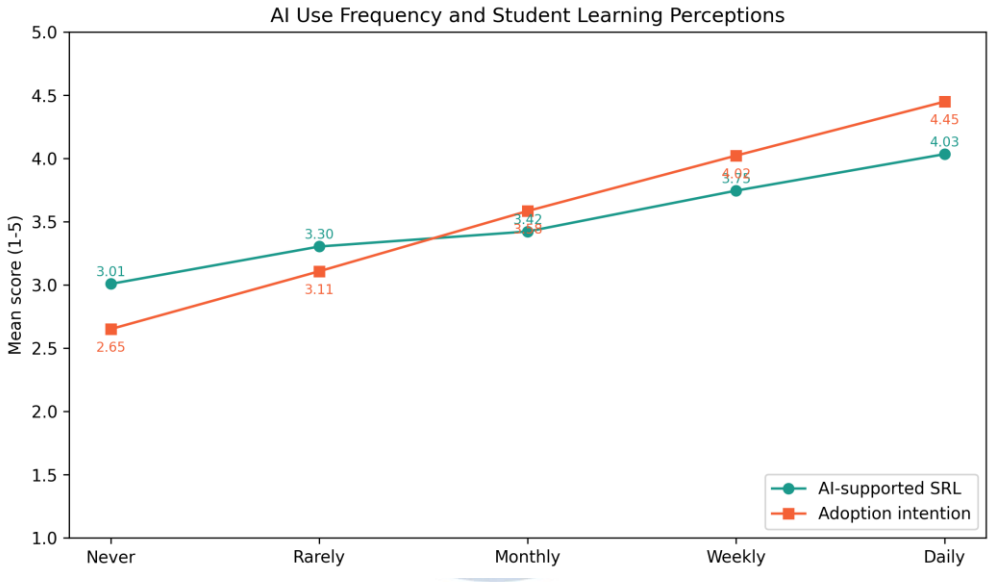

Figure 3. Mean AI-supported SRL and adoption intention by AI use frequency.

Note. Both SRL support and adoption intention increased as AI use became more frequent.

Table 8. Summary of demographic and academic differences in AI-supported SRL.

Variable	*Main result*	*Statistic*	*p*	*Decision*
Gender	No significant difference in AI-supported SRL	t(311) = -1.36	.175	Not supported
Study year	Mean SRL increased across senior study years	F(3, 316) = 6.84	< .001	Supported
Discipline	Differences were small and not statistically significant	F(6, 313) = 1.12	.349	Not supported
Prior AI training	Trained students reported higher SRL support	t(318) = 5.24	< .001	Supported
OBE awareness	Higher awareness was linked with higher AI-supported SRL	F(4, 315) = 24.18	< .001	Supported
AI-use frequency	More frequent AI use was linked with higher AI-supported SRL	F(4, 315) = 29.63	< .001	Supported

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

Note. Independent-samples t-tests were used for two-group comparisons, and one-way ANOVA was used for variables with more than two groups. The gender comparison excluded the very small 'prefer not to say' group from the t-test.

The results of the demographic analysis indicated that students did not experience the same type of SRL with AI use in all academic contexts. There were significant differences on the factors of study year, prior AI training, awareness of OBE and the frequency of using AI to learn themselves, which shows that exposure, prior training, and outcome awareness can enhance the ability of students in using AI to learn themselves. No statistically significant differences were found between gender or discipline suggesting that AI-supported SRL was more dependent on learning experience and preparation rather than on gender or discipline.

4.7 Mediation-Style Path Analysis

Table 9. Mediation-style analysis of AI-supported SRL.

Path	*Relationship*	*Estimate*	*p*	*Bootstrap result*
a	AI positive perception -> AI-supported SRL	0.604	< .001	
b	AI-supported SRL -> engagement (controlling AI perception)	0.471	< .001	
c	Total effect: AI positive perception -> engagement	0.777	< .001	
c'	Direct effect after mediator	0.492	< .001	
ab	Indirect effect (bootstrap 5,000 samples)	0.285		95% CI [0.169, 0.400]

Note. Indirect effect tested with 5,000 bootstrap resamples. CI = confidence interval.

The relationship between AI-positive perception and learning engagement was mediated by a partial link, namely, AI-supported SRL. The indirect effect had a positive value (ab = 0.285) and the 95% bootstrap confidence interval [0.169, 0.400] did not contain 0. Thus, positive perceptions of AI seem to be related to greater engagement, at least in part because AI enables the students to regulate their learning.

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

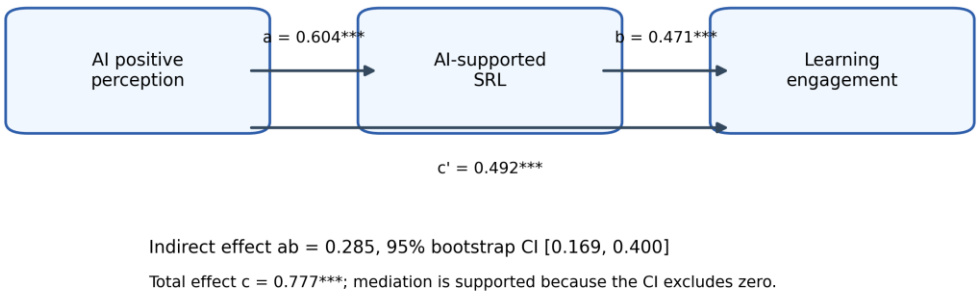

Figure 4. Mediation-style model with unstandardized path coefficients.

5. Discussion

The results indicate that generally the AI is considered to be useful and accessible as a learning support tool for Undergraduates in OBE. The highest mean was found for ease of use, which suggests that students are technology savvy in working with AI tools. The relative weakness of the responsible AI readiness score, however, suggests that the issues of the dependency and "over-reliance" as well as ethical concern are still significant obstacles. This trend is in line with the existing literature, which suggests that students recognize the learning opportunities AI brings but are also worried about its accuracy, integrity, privacy, and future impact on learning (Chan & Hu, 2023; Kasneci et al., 2023; UNESCO, 2023). This research has been further extended by the connection of the added demographic analysis, which illustrates that the use of AI in SRL was more robust among students who used AI more frequently, had previous experience with AI, rated their awareness of OBE higher, and held more advanced study-year status. This indicates that, in addition to overall technological acceptance, students' willingness to use AI-supported SRL must also depend on their readiness for and familiarity with SRL tools, and their awareness of the learning objectives in outcomes-based learning. Hence, it is essential to offer AI literacy and to orient students to OBE as early as possible in Universities, particularly since some of them lack AI experience and have lower awareness of learning outcomes.

The positive correlation between AI-positive perception and AI-supported SRL highlights that students with a more positive attitude towards AI are more inclined to employ it for setting learning goals, planning, monitoring, when they need help, for reflection, and for time management. This is in line with SRL theory that emphasises active agent of the learner and strategic control of L2 learning processes (Pintrich, 2000; Zimmerman, 2002). It also is aligned with the emerging AI-SRL research that reveals AI may scaffold the forethought, performance, and reflection stages of SRL instead of replacing students' actions (Lan & Zhou, 2025).

The importance of OBE alignment is in theory. Clarity of learning outcomes and constructive alignment among learning outcomes, learning activities and assessment are necessary for OBE (Biggs, 1996; Spady, 1994). Based on the findings of this study, Perceived OBE Alignment was found to be positively related to AI-supported SRL and was a significant predictor in regression analysis. This implies, students might gain most from

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

aiding AI when they can be associated to the learning outcomes, competency expectations, assessment/feedback rubrics and the course.

The findings indicate a negative association between ethical concern and adoption intention, supporting the critical need to govern AI responsibly. Student's fear of academic dishonesty, inaccurate AI results, and reliance dependence on the use of AI may be a reason to avoid or limit its use. Hence institutions should not just focus on the punitive approach of AI. They should offer clear guidelines for the use of AI, disclosure rules based on the assessment context, whether it is acceptable or not to use AI, AI literacy training, and examples of acceptable AI-assisted SRL activities.

More specifically, mediation type results imply that AI doesn't necessarily enhance engagement. Rather, it seems that AI-based positive perception promotes engagement via SRL. AI is educationally valuable in practice when it allows students to plan learning processes, monitor, receive feedback on, and reflect on the outcomes of their learning. This discovery finds a move from an AI answer manufacturer to an AI controlled learning companion.

6. Practical Implications

- Orient students on AI and how it can be used in an ethical manner to explain learning outcomes, rubrics and competency expectations from the inception point of the OBE orientation.
- The AI-supported SRL tasks can be designed by the course instructors, including AI-assisted goal setting, rubric self-checking, reflective prompting, feedback verification and study planning.
- Policies in relation to assessment should differentiate between prohibited AI mediated substitution and the permitted process of AI-supported learning.
- Learning management systems must have responsible AI guidance, prompt logs or templates, and reflection logs to make sure AI use is for genuine learning.
- The cornerstone of faculty development is guiding course design and use of AI toward positive alignment with course learning outcomes, assessment tasks and feedback loops.
- There is a need for additional support in the arena of AI literacy and responsible use training workshops and awareness of OBE for all student groups, identified through a demographic and academic difference analysis.

7. Limitations and Future Research

There are limitations of the study. Does not imply causality with cross sectional data. Second, the study is based on self-reported perceptions instead of observed use and learning performance in relation to AI. Third, demographic and academic group differences were explored and future studies should utilize larger multi-institutional samples in order to validate these differences. Future studies must be carried out to gather or revisit data in the field, to make more detailed comparisons between disciplines, to conduct qualitative interviews, or to explore whether AI-supported SRL positively affects the attainment of actual outcomes by using learning analytics and/or experimental designs.

8. Conclusion

This study aimed to explore the student perspective on the use of AI to facilitate SRL in OBE. Frequencies of the data indicated that students' perception of usefulness, ease of use, trust to use AI, alignment with OBE, SRL support, engagement in using AI and intention to adopt AI was found to be moderate-high. AI-positive perception, usefulness, ease of use, trust, OBE alignment, AI-use frequency, and OBE awareness were significant determinants for AI-supported SRL, with ethical concern having a negative impact on adoption intention. The supplemental analysis of the demographics revealed that AI-supported SRL had significant differences according to study year, previous AI training, OBE awareness, and the frequency of using AI, showing that context and student preparedness were important factors for the regulation of L2 writing

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

when using AI. AI-assisted SRL was also found to be a predictor of learning engagement, and played a partial mediator role between AI-positive perception and learning engagement. The results indicated that AI could play a role in OBE as a responsible learner-centred scaffold in the process of goal setting, monitoring, feedback usage, reflection and/or attainment of competency.

REFERENCES

Biggs, J. (1996). Enhancing teaching through constructive alignment. Higher Education, 32(3), 347-364. https://doi.org/10.1007/BF00138871

Biggs, J., & Tang, C. (2011). Teaching for quality learning at university: What the student does (4th ed.). Open University Press.

Chan, C. K. Y., & Hu, W. (2023). Students' voices on generative AI: Perceptions, benefits, and challenges in higher education. International Journal of Educational Technology in Higher Education, 20, Article 43. https://doi.org/10.1186/s41239-023-00411-8

Crompton, H., & Burke, D. (2023). Artificial intelligence in higher education: The state of the field. International Journal of Educational Technology in Higher Education, 20, Article 22. https://doi.org/10.1186/s41239-023-00392-8

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319-340. https://doi.org/10.2307/249008

Hayes, A. F. (2022). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach (3rd ed.). Guilford Press.

Jin, S. H., Im, K., Yoo, M., Roll, I., & Seo, K. (2023). Supporting students' self-regulated learning in online learning using artificial intelligence applications. International Journal of Educational Technology in Higher Education, 20, Article 37.

Kasneci, E., Seßler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., ... Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. Learning and Individual Differences, 103, Article 102274. https://doi.org/10.1016/j.lindif.2023.102274

Lan, M., & Zhou, X. (2025). A qualitative systematic review on AI empowered self-regulated learning in higher education. npj Science of Learning, 10, Article 21. https://doi.org/10.1038/s41539-025-00319-0

Miao, F., & Holmes, W. (2023). Guidance for generative AI in education and research. UNESCO.

Nunnally, J. C., & Bernstein, I. H. (1994). Psychometric theory (3rd ed.). McGraw-Hill.

Panadero, E. (2017). A review of self-regulated learning: Six models and four directions for research. Frontiers in Psychology, 8, Article 422. https://doi.org/10.3389/fpsyg.2017.00422

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), Handbook of self-regulation (pp. 451-502). Academic Press.

Slimi, Z., Benayoune, A., & Alemu, A. E. (2025). Students' perceptions of artificial intelligence integration in higher education. European Journal of Educational Research, 14(2), 471-484. https://doi.org/10.12973/eu-jer.14.2.471

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • 2026

Spady, W. G. (1994). Outcome-based education: Critical issues and answers. American Association of School Administrators.

UNESCO. (2023). Guidance for generative AI in education and research. UNESCO.

Zawacki-Richter, O., Marin, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education: Where are the educators? International Journal of Educational Technology in Higher Education, 16, Article 39. https://doi.org/10.1186/s41239-019-0171-0

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. Theory Into Practice, 41(2), 64-70. https://doi.org/10.1207/s15430421tip4102_2

JOURNAL FOR SOCIAL SCIENCE STUDIES
ADVANCING KNOWLEDGE, INSPIRING SOCIETY