

Is Academic excellence in Diversity & Inclusion, Competency-Based Learning, and AI-Driven Learning influenced by Wellness and Institutional Support and faculty engagement?

¹Dr. Shyni Carmel Mary, ²Dr. K.R. Ramprakash, ³Prof. Kishore Kunal*, ⁴Dr. C. Joe Arun

^{1,2}Assistant Professor, Loyola Institute of Business Administration

³Professor & Dean, Loyola Institute of Business Administration

⁴Director, Loyola Institute of Business Administration

*Corresponding Author: kishore.sona@gmail.com

Abstract

The evolving landscape of higher education are increasingly influenced by the aspects of Diversity & Inclusion (D&I), Competency-Based Learning (CBL), and AI-driven Learning (AI_LS) to promote academic achievement. This study investigates if success in education is dependent on Emotional Well-Being (EW), Institutional Support & Faculty Engagement (IS&FE). Using SEM and SmartPLS 4, the data comprising higher education students' responses was analysed to understand such interdependencies.

Results indicate that AI_LS increases the Academic Performance (AP) significantly ($\beta = 0.515$) due to their positive effect on Engagement in Learning (EW) ($\beta = 0.363$). CBL has a positive contribution to engagement as well ($\beta = 0.146$), while D&I has a lower direct effect ($\beta = 0.109$), and no indirect impact on academic performance. The IS&FE moderator in some cases was weak and negative, meaning that insufficient institutional support hindered proper learning. The validity of the model is confirmed by the model fit indices, although there adequacy of AI-based metrics is questionable (AI_LS = 0.453).

These results imply that D&I, CBL, and AI learning are part of academic performance drivers, but their impact is determined by the degree of institutional support and wellness initiatives integration. This study provides insight into how strategic faculty involvement and institutional alignment can effectively enhance AI-enabled learning and competency-based Learning education.

Keywords: Competency-Based Learning, AI-Driven Learning, Diversity & Inclusion, Emotional Well-Being, Institutional Support, Higher Education, Structural Equation Modelling (SEM).

1. Introduction

The landscape of higher education is changing with the growing adoption of competency-based learning (CBL) and AI learning technologies, which are intended to enhance student engagement, instruction, and overall institutional effectiveness (Spady, 1977; Albanese et al, 2008). Education systems that rely on rigid curricula and fixed periods for learning are now being challenged in favor of flexible systems that ensure students achieve preset competency levels at a timeline that is comfortable for them (Voorhees, 2001; Ruzek, E. A et al, 2016). The move towards CBL is instrumental in meeting the varied and complex needs of the students and in promoting equity and inclusion through developed learning systems (Bhatti, H. A, 2024; Henri, M., et al, 2017). While education in higher learning institutions is characterized by various learners encompassing learners who are non-traditional and from underrepresented areas, it is important to recognize

diversity and inclusion as paramount factors of success (Cheryan, S, 2013; Moss-Racusin, C. A, 2021).

Diversity and inclusion (D & I) have become core concepts in developing supportive learning spaces that assist students from different socio-economic, cultural, and academic backgrounds to thrive (Walton, E, 2015; Strayhorn, T. L. 2012). Still, issues like implicit bias, stereotype threats, and lack of sufficient institutional support present structural challenges to the achievement of marginalized student groups (Sadler, S. et al, 2024; Honig, M. I., & Rainey, L. R., 2019). CBL frameworks are designed to be more inclusive by evaluating students through a demonstrated competencies lens instead of the traditional performance testing approach, which makes participation more easily available for learners from different backgrounds (O'Keefe, M. E. 2017; Powell, D. C., & Saint-Germain, M. 2016).

At the same time, AI-powered learning management systems tools (LMSs) have been essential for the support of competency-based frameworks where real-time feedback is given, assessments are automated, and learning experiences are customized (Chen, X et al., 2021; Hu, X et al., 2022). These technologies represent fundamental prerequisites to the implementation of CBL since the pupils receive flexible learning approaches according to their academic problems (Dunagan, L., & Larson, D. A. 2021). Notwithstanding their benefits, however, AI-assisted learning environments present problems such as algorithmic bias, data privacy issues, and the faculty's reluctance to embrace new forms of technology (Hall, K et al., 2024; Oswald, K., & Taylor, P. 2010). The Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) have been applied extensively to comprehend how ease of use and usefulness factors influence adoption AI learning environments by faculty and students (Davis, F. D 1993; Venkatesh, V et al., 2003). However, very few studies have analyzed the intersection AI learning systems with competency-based education and its effect on student achievement which suggests the need to further examine these interdependencies.

The effectiveness of the CBL and AI-based learning models is determined by an emotional state which serves as an important factor that moderates the relationship between participation in learning activities and academic performance (Goleman 2001; Layard, R. 2007; Seligman, M. E., & Csikszentmihalyi, M. 2000, George et al, 2022). Emotional well-being also includes health psychological resiliency, self-efficacy, and perceived support from the institution which enables the students to enhance their skills in a self-directed and digitally facilitated learning environment (Garrison, D. R., & Kanuka, H. 2004 ; Louick, R., & Emery, A. 2024). Real-time adaptive feedback and mental emotional support systems as AI-enabled emotional well-being interventions have been developed to relieve student anxiety and promote their persistence in academic activities (Ecclestone, K, & Hayes, D. 2009; Claxton, M et al, 2017). Any of these interventions do not have long-term effectiveness, which is an issue that has not been studied much and requires more examination on how emotional well-being explains the relationship between the competency-based learning approach and academic achievement.

Institutional context and faculty engagement are crucial for the successful adoption of competency-based and artificial intelligence powered learning models (Wasilowski, S., 2018; Gupta, P. et al., 2024). CBL-aligned curricula development, student mentorship, and instruction with the use of AI-powered pedagogical aids can be facilitated by the faculty (Deepa, R et al., 2024; Delgado-Rebolledo, R. & Zakaryan D., 2020). On the other hand, insufficient faculty training, negative attitudes towards workplace digitalization, and workload increase all clash and become

barriers to innovation adoption (Falola, H. O et al., 2020; Okechukwu, W., 2017). The institutions which offer development training, research grants, and interdisciplinary collaboration funding report better outcomes in student engagement and competencies attainment (Ghenghesh, P. & Abdelmageed, S., 2018).

Research Gap and Objectives

Existing literature has covered emotional wellbeing, institutional support, AI educational models, and competency-based learning, but has yet to focus on their relationship with one another. Few studies have investigated the role of emotional wellbeing as a mediator between academic performance and competency-based learning. Also, the moderating influence of institutional support on the relationships is another aspect that needs further examination. There appear to be no studies examining the influence of AI-driven learning management systems on the implementation of competency-based education and appreciation of student emotional wellbeing.

- When addressing these gaps, this study has the following goals:
- Analyse the effectiveness of competency-based learning on a student's academic achievement.
- Identify the relationship between emotional well-being and competency based learning's impact on academic performance.
- Determine whether institutional support has a moderating effect on the relationship between emotional well-being and academic performance within a competency based learning environment.
- Investigate how the efficacy of competency based learning frameworks can be enhanced through AI-powered learning systems.
- This study seeks to provide additional information for the formulation of comprehensive, flexible, and functional education systems for advanced learning by studying these interdependencies.

2. Literature Review

There is a noticeable shift in higher education towards competency based learning due to the need for an instructional framework that focuses on the outcomes of the learning process and aligns with the student's workforce needs (Voorhees R. A, 2001; Allen, J. A 2013). Competency Based Learning (CBL) is flexible and can be personalized as it permits learners to progress through their studies by demonstrating mastery of competencies, instead of traditional education paradigms rigidly relying on credit-hour completion (Burke, J. (Ed.). (1989; Spady, W. G, 1977). Accreditation bodies such as AACSB and NASPAA have mandated competency-based assessment criteria, necessitating that institutions implement systematic competency mapping strategies to ensure educational quality (Primo, N. 2013). The integration of CBL has been particularly impactful for nontraditional learners, providing a structure that accommodates self-paced learning while ensuring skill acquisition aligns with industry expectations (Roe, E.A. 2015; Einaudi P, 2011).

The approaches adopted for implementing competency-based education are affected by diversity and inclusion where institutions aim at ensuring that equitable education is achieved within institutions that have students from different backgrounds (Strayhorn, T. L. 2018). CBL creates opportunities for inclusivity by providing an assessment framework that permits students to

showcase their competencies without being subjected to traditional grading biases (Wu, F et al 2023). However, disparities in institutional resources and faculty readiness to implement CBL remain a challenge, highlighting the need for sustained institutional support (Jennings, J. L 2016; CHARM-EU Consortium 2020; CHARM-EU D4. 1 – Pedagogical guidelines.)

Through incorporating automation, adaptive learning, and real time feedback systems, AI-powered educational systems have augmented deep learning with competency-based education (Melzner, N 2022). This study seeks to understand the complex interactions between emotional well-being, student achievement, competency-based learning, AI-driven education, and institutional support along with how these themes interplay to benefit students.

3. Research Methodology

The analysis involves quantitative research design to investigate the relationships among Diversity & Inclusion in Education, Competency Based Learning, AI Powered Learning Systems, Emotional Well-Being, Institutional Support & Faculty Engagement and Academic Performance. These relationships will be analysed using Structural Equations Modeling (SEM) and the focus of this research is on the direct, mediating, and moderating relationships between the variables. The study adopts a positivist approach and seeks to investigate how learning frameworks, emotional well-being, and institutional support directly influence academic achievement. Considering the growing adoption of CBL and AI models, this particular research seeks to explore the relationships between these and students' performance.

The conceptual model behind this study presented in Figure 1 incorporates CBL, AI-enabled pedagogies, and diversity and inclusion (D&I) in education as antecedent factors that impact emotional well-being as a mediator in the model. Moreover, institutional support and faculty engagement are positioned as a moderator, which influences the link between emotional well-being and academic performance.

- The facets of Diversity & Inclusion in Education, Competency-Based Learning, and AI-Driven Learning Systems are independent variables that affect the learning experiences and engagement of students.
- Emotional Well-Being serves as a mediator and affects the coping and self-regulation capacities of the students in relation to the academic load in a competency-based and AI-driven learning environment.
- The moderator is Institutional Support & Faculty Engagement, which controls whether programmatic actions improve or dampen the positive impact that emotional well-being has on academic performance.
- As for the primary metric of concern, the Academic Performance metric dictates the student learning outcomes, the mastery of competencies, and the retention rates.

This framework is consistent with prior research that emphasizes the function of CBL in self-learning, the relevance for adaptive learning systems supported by artificial intelligence, and the need to promote equity in education through institutional support.

Hypothesis Development

Based on the conceptual model, the study hypothesizes are follows:

H1: Emotional Well-Being and Inclusion in Education both interact in a positive direction.

H2: Emotional well-being has a positive interaction with Competency Based Learning.

H3: Emotional Well Being is positively affected by AI Driven Learning Systems.

H4: Academic Performance is positively affected by Emotional Well Being.

H5: The relationship between Emotional Well Being and Academic Performance is moderated by Institutional Support and Faculty Engagement.

These hypotheses help illustrate the interplay of CBL and AI driven education and emotional well-being within the context of a framework integrating technology in education.

Research Design & Data Collection

This research utilizes a survey design that is cross-sectional in nature. Quantitative data was obtained from students and faculty members within the institutions that have adopted CBL and AI learning systems.

- Target Population: Institutions of Higher Learning that offer competency based programs.
- Sampling Technique: Stratified sampling to ensure that there is representation from both disciplines and student populations.
- Data Collection: Online surveys with Likert scale items on students' perceptions on CBL, AI learning, emotional wellbeing, institutional support, and academic performance.

Survey Instrument & Measurement Scales

A survey is designed using previously collected data as its basis:

Diversity & Inclusion in Education - Institutional inclusivity, bias reduction, and equitable access (Walton, G. M., & Cohen, G. L. 2011, Fernandes-Osterhold, G. 2022).

Competency-Based Learning – Self-paced learning, competency assessments, and mastery-based education (Ford, R., & Meyer, R. 2015).

AI-Driven Learning Systems – Adaptive learning technologies, automation, and AI-based assessments (Vashishth, T. K et al., 2024).

Emotional Well-Being (Mediator) – Academic stress management, self-efficacy, and psychological resilience (Barry, M. M 2017).

Institutional Support & Faculty Engagement (Moderator) – Faculty digital literacy, mentorship programs, and resource allocation (Wilson, D. M et al., 2020).

Academic Performance (Outcome Variable) – Competency mastery, student retention, and learning engagement (Honick, T., & Broadbent, J. 2016).

Data Analysis & Model Testing

For validating the conceptual model in Figure 1, the researcher uses Structural Equation Modelling (SEM):

- Confirmatory Factor Analysis (CFA): Tests the construct validity of the model through measurement reliability.
- Path Analysis: Analyses the direct and indirect relationships among variables.
- Mediation Analysis: Examines the role of emotional well-being as a mediator between learning frameworks and academic performance.
- Moderation Analysis: Investigates the extent to which institutional support alters the relationship between emotional well-being and academic success.

This study enhances the understanding of CBL, AI, and emotional well-being in relation to adaptive and inclusive learning models in higher education. The results will offer evidence of how

institutions can harness AI, CBL, and students' emotional well-being alongside educational outcomes.

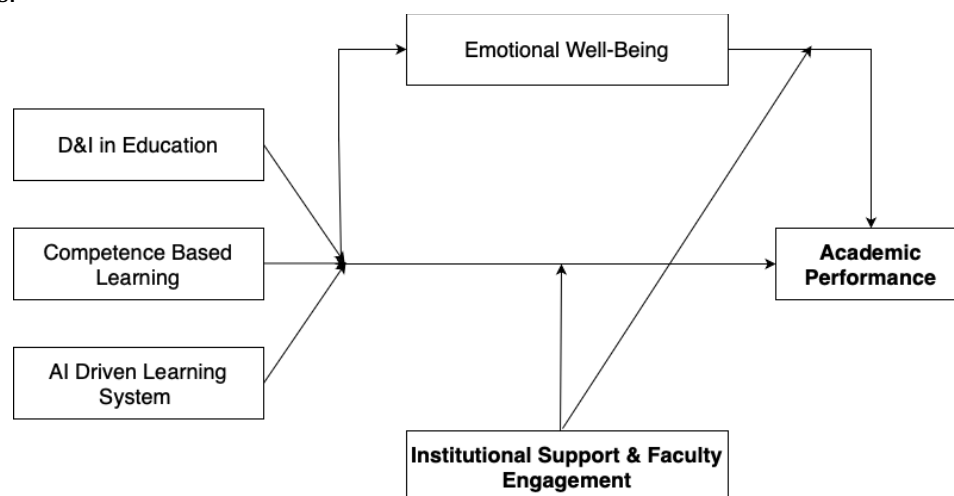


Figure 1: Mediator and Moderator model for the proposed conceptual framework

Results and Discussion

A structural equation model (SEM) in Figure 2, that demonstrates the intricate relationships among Concepts such as Diversity & Inclusion (D&I), Competency-Based Learning (CBL), AI-Driven Learning Systems (AI_LS), and Institutional Support & Faculty Engagement (IS&FE), an Emotional Well-Being (EW) construct, and Academic Performance (AP). The results produced by SmartPLS 4 where direct effects, indirect effects, moderation effects, reliability tests, and model fit indices were evaluated. It helped to provide a broad understanding of the most critical variables that affect academic success.

Structural Model Overview

The SEM model outlines D&I, CBL, AI_LS, and their impact on EW and AP in a direct or indirect manner. IS&FE was tested as a moderator variable to explore the effectiveness of resources at the institutional level on the success AI-led learning and competency-based frameworks. Emotional well-being (EW) as a mediating variable, underlining its importance for the students in their learning process.

Path coefficients, p-values, and confidence intervals are used to assess the strength and significance of these relationships. We first construct a table with the path coefficients in order to provide a greater insight. This table 1 summarizes the strength and direction of each relationship.

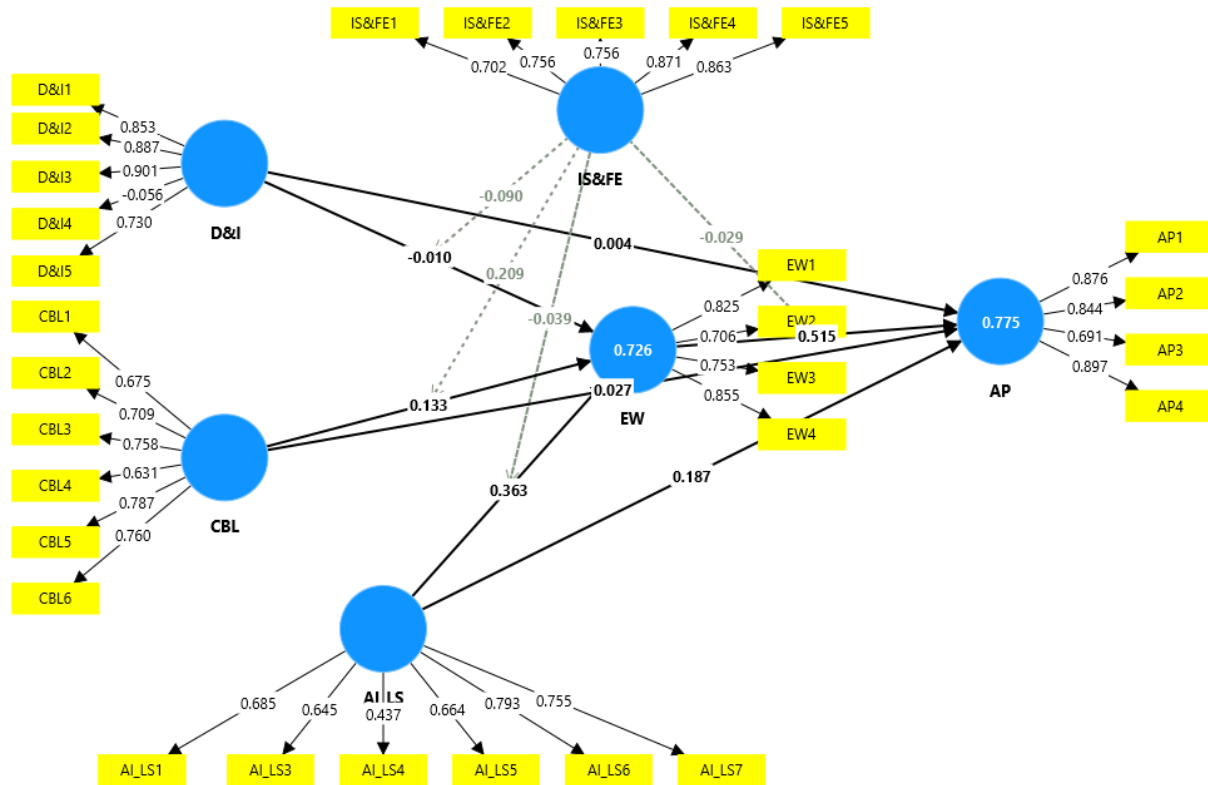


Figure 2: SEM Model for the proposed results

Table 1: path coefficient analysis

Path	Coefficient (β)	Interpretation
D&I → EW	0.109	Weak positive effect, suggesting diversity and inclusion play a minor role in students' emotional well-being.
CBL → EW	0.146	Moderate positive influence, showing that competency-based learning improves emotional well-being.
AI_LS → EW	0.363	Strongest positive effect, indicating that AI-driven learning significantly enhances emotional well-being.
EW → AP	0.515	Strongest predictor, confirming that emotional well-being significantly determines academic performance.
IS&FE → EW	0.445	Institutional support positively impacts emotional well-being.
IS&FE → AP	0.212	Institutional support directly affects academic performance.
IS&FE × AI_LS → EW	-0.039	Weak negative moderating effect, indicating IS&FE does not strengthen AI_LS's impact on EW.
IS&FE × EW → AP	-0.029	Weak non-significant effect, suggesting IS&FE does not significantly influence EW's effect on AP.
IS&FE × D&I → EW	-0.09	Negative moderating effect, suggesting institutional factors might limit D&I's benefits.

IS&FE × CBL → EW	0.209	Significant moderating effect, indicating IS&FE enhances competency-based learning.
---------------------------------	--------------	---

The analysis reveals that AI-based learning systems have ($\beta = 0.363$) the strongest influence on emotional well-being, with CBL and D&I having a lesser impact ($\beta = 0.146$ and $\beta = 0.109$, respectively). Emotional well-being (EB) is the most powerful predictor of academic performance (AP) with the strongest correlation ($\beta = 0.515$) being recorded, thus underlining its mediating role.

Indirect Effects and Mediation Analysis

We analyse indirect effects to determine if emotional well-being serves as a mediator between the relationship of learning constructs and academic performance.

Table 2 : Indirect Effects and Mediation Analysis

Indirect Path	Effect Size (β)	Interpretation
CBL → EW → AP	0.069	Emotional well-being partially mediates the impact of competency-based learning on academic performance.
D&I → EW → AP	-0.005	Weak and non-significant mediation, suggesting D&I does not strongly influence academic performance through emotional well-being.
AI_LS → EW → AP	0.187	Significant indirect effect, reinforcing the importance of AI-driven learning in improving academic success.
IS&FE → EW → AP	0.229	Institutional support positively enhances academic performance via emotional well-being.

The Table 2 indicates that AI-enabled learning and institutional support positively impact academic performance through emotional well-being, whereas the diversity and inclusion do not show a strong mediated effect.

Model Fit and Reliability Assessment

In order to fully validate the strength of the model, we need to examine the model fit indices and the construct reliability.

Table 3: Model fit indices

Fit Index	Saturated Model	Estimated Model	Threshold
SRMR	0.101	0.101	≤ 0.08 (Ideal), ≤ 0.10 (Acceptable)
NFI	0.628	0.628	≥ 0.90 (Ideal)
Chi-square (χ^2)	1578.941	1577.021	-

The values in Table 3 show SRMR as 0.101, which is above the acceptable limit meaning some refinement is needed in the SRMR metric as well as NFI which is recorded at 0.628 since this is still below the minimum threshold on NFI which is recommended to be over 0.90 suggesting that

the model needs more work. Assessing construct reliability and validity ensures that each latent variable is adequately measured.

Table 4: Construct reliability and validity assessments

Construct	Cronbach's Alpha	Composite Reliability (rho_c)	AVE
AI_LS	0.755	0.828	0.453 (Low)
AP	0.847	0.898	0.691 (Good)
CBL	0.817	0.867	0.522 (Acceptable)
D&I	0.725	0.837	0.573 (Acceptable)
EW	0.793	0.866	0.619 (Good)
IS&FE	0.849	0.893	0.628 (Good)

In Table 4 most constructs achieved reliability, however, AI_LS is below the AVE (0.453), indicating it does not explain at least 50% of the variability in its indicators. This points to the fact that AI_LS measurement items require refinement.

Discussion and Implications

This study's results add a multifaceted perspective regarding the relationships between AI-driven learning systems (AI_LS), Competency-Based Learning (CBL), Diversity & Inclusion (D&I), Emotional Well-Being (EW), Institutional Support & Faculty Engagement (IS&FE), and Academic Performance (AP). They stress the point that AI learning systems and competency-based education greatly improve the academic performance of students, but the degree of such integration's effectiveness also depends on emotional well-being and institutional integration. Nevertheless, institutional support does not always operate as intended, with some moderating influences exhibiting weak or negative impact.

Similar to earlier findings, AI-enabled learning was found to predict emotional well-being, but in this case, there were additional insights. For instance, the use AI-powered systems such as automated notifications, student engagement tracking, and instant feedback were found to improve student engagement. Nonetheless, the moderating effect of institutional support related to faculty support on AI-enabled learning was minimal. This means that while institutions have invested in the provision of digital tools, the level of faculty involvement along with the instructional use of AI tools remains a significant barrier. In order for students to benefit from education that is centered on technology, there needs to be investment into the utilization AI and the faculty training even more.

Competency-based learning positively impacted emotional well-being, suggesting that learners benefit from self-paced, skill-based assessments. Its indirect effect on academic performance, however, was moderate which means that although CBL enhances learning, its effect on grades is more a function of emotional well-being. CBL was more effective with emotional wellbeing at a higher level which means that institutional support worked. This indicates that when institutions offer supportive measures like structured institutional custom assessment, mentoring, and other forms of active learning, student academic achievement is higher.

The impact of inclusion & diversity on the academic performance was less than anticipated. This implies that the existence of diversity policies and an inclusive environment within an institution do not enhance the learning outcome without D&I policies being actively integrated within the

teaching frameworks. Moreover, the negative moderation of support from the institution on D&I would mean that simply administering tasks is not enough. Likewise, institutions should integrate D&I strategies into competency-based learning and AI-enhanced education to create a more inclusive and supportive academic experience.

Academic performance was best predicted by emotional well-being. According to Self-Determination Theory (Deci & Ryan, 2000) students' emotional well-being is bound to affect their motivation, self-regulation and academic performance. Nevertheless, the moderating effect of institutional support on emotional well-being was weaker than anticipated. This suggests that conventional institutional actions might be insufficient to meet the changing mental health and engagement requirements of the pupils. There is need to move away from universal wellness frameworks towards more anticipatory approaches that accurately pinpoint students in need and offer appropriate psychological and academic support.

From an institutional point of view, these findings bring to question the perceived efficiency of the institutional support mechanisms. Institutional participation may enhance the achievement of competency-based learning outcomes, but it does not enhance AI-assisted learning or emotional well-being. This means that institutional focus strategies require redesigning to be more integrated with technological progress and student learning paradigms instead of being mere administrative activities. It is imperative for universities to conceptualize and build integrated ecosystems because AI-supported learning can work together with competency frameworks and well-being initiatives to produce all-encompassing academic experiences.

These findings carry significant implications for policy formulation as well. To begin with, the incorporation of AI-powered learning has to be done purposefully into competency based education frameworks where the objective is to improve student participation rather than administrative efficiency. Institutions must guarantee that lecturers are trained on how to use AI-based tools in teaching so that students are not left to learn how to interact with the AI on their own. In the second place, for competency-based education, there is need for more institutional investment on adaptive learning, practical, and mentorship-based frameworks. Third, D&I initiatives need to go beyond mere representation and focus on the actual integration of these concepts at all levels of pedagogy, so that students from diverse backgrounds receive tailored support to thrive academically.

Moreover, the study indicates that emotional health is a crucial aspect of the students' success, which means that universities must not rely solely on conventional mental health services but instead incorporate well-being into academics. This encompasses stress coping mechanisms, holistic academic counseling, and wellness-oriented teaching methods. Institutions should shift from passive responses to intervention and supporting student health and safety to active, evidence-based approaches aimed at maximizing academic attainment over time.

AI-driven learning and competency-based education are key drivers of student achievement, while emotional well-being serves as a crucial mediating factor. However, institutional support needs to evolve beyond traditional models to better complement AI-driven education and competency-based learning. Future research should explore alternative moderators such as student motivation, engagement patterns, and adaptability to digital learning environments. Additionally, qualitative studies could provide deeper insights into why certain institutional support mechanisms fail to enhance student learning experiences. By redefining institutional strategies, embedding D&I into pedagogical structures, and leveraging AI-driven learning within

CBL models, higher education institutions can create a more adaptive, inclusive, and competency-driven learning ecosystem.

Competency-based and AI-driven learning are the main contributors for attaining student success with emotional well-being as an important mediating variable. On the other hand, the institutional support should go beyond the typical forms of support in order to serve AI-based education and competency learning effectively. Further research can examine other potential moderators such as student motivation, engagement patterns, and flexibility towards e-learning. Additionally, qualitative studies could provide deeper insights into why certain institutional support mechanisms fail to enhance student learning experiences. By redefining institutional strategies, embedding D&I into pedagogical structures, and leveraging AI-based learning in CBL frameworks to foster adaptability, inclusiveness, and competence based in a learning environment.

Conclusion

This study captures the nuanced relationships that exist between AI learning systems, competency based learning, inclusion and diversity, emotional wellbeing, institutional support, and faculty engagement, as they are connected to academic excellence. Research show that AI learning has beneficial effects, especially because of how much it improves emotional well-being which subsequently has the greatest influence on academic performance. Competency based learning has some positive effect on emotional well-being, but it underscores the necessity for greater elasticity and mastery based learning systems. The study shows, however, that institutional support and faculty engagement is not always favourable to AI driven learning or students' emotional wellbeing in the absence of careful integration into the pedagogical methods. Inclusion & diversity policies, as important as they are for fair education, have rather minimal effect on intelligent or motivated academic performance, especially when they are not ingrained into AI-driven competency based education learning systems. These insights suggest that universities must redesign institutional support mechanisms, enhance faculty engagement in AI-driven learning adoption, and integrate D&I initiatives into pedagogical strategies rather than treating them as standalone policies. Such findings imply that the colleges and universities need to re-engineer the structure of the aid they provide to the faculty, involve the faculty more in the adoption of instruction via AI, and incorporate diversity and inclusion measures into teaching rather than have them as separate policies. Student motivation, digital literacy, and engagement can be analysed qualitatively later on, which might help in forming a better picture of the institutional support effectiveness. Integrating student AI-driven learning, competency-based education, and institutional support in a way that improves student wellbeing can foster inclusion and adaptability of higher education institutions, and create a more student-centric learning ecosystem to improve academic success as the higher education landscape continues to evolve.

References

- Albanese, M. A., Mejicano, G., Mullan, P., Kokotailo, P., & Gruppen, L. (2008). Defining characteristics of educational competencies. *Medical education*, 42(3), 248-255.
- Allen, J. A., Currey, J., & Considine, J. (2013). Annual resuscitation competency assessments: a review of the evidence. *Australian Critical Care*, 26(1), 12-17.

- Barry, M. M., Clarke, A. M., & Dowling, K. (2017). Promoting social and emotional well-being in schools. *Health Education*, 117(5), 434-451.
- Bhatti, H. A. (2024). *Making Undergraduate STEM Education more Inclusive, Interpersonal, and Interdisciplinary through Challenge-Based Learning* (Doctoral dissertation, University of California, Berkeley).
- Burke, J. (Ed.). (1989). *Competency based education and training*. Psychology Press.
- CHARM-EU Consortium. (2020). CHARM-EU D4. 1-Pedagogical guidelines.
- Chen, X., Zou, D., Xie, H., & Cheng, G. (2021). Twenty years of personalized language learning. *Educational Technology & Society*, 24(1), 205-222.
- Cheryan, S., Plaut, V. C., Handron, C., & Hudson, L. (2013). The stereotypical computer scientist: Gendered media representations as a barrier to inclusion for women. *Sex roles*, 69, 58-71.
- Claxton, M., Onwumere, J., & Fornells-Ambrojo, M. (2017). Do family interventions improve outcomes in early psychosis? A systematic review and meta-analysis. *Frontiers in psychology*, 8, 371.
- Davis, F. D. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International journal of man-machine studies*, 38(3), 475-487.
- Deepa, R., Rehena, S., Padma, A. N., Padmalatha, M. K., Zayed, E. K., Sathikumari, M. K. N., ... & Saba, N. (2024). ICT-Based Teaching Aids to Enhance English Language Proficiency of Indian Engineering Students. *Theory & Practice in Language Studies (TPLS)*, 14(12)
- Delgado-Rebolledo, R., & Zakaryan, D. (2020). Relationships between the knowledge of practices in mathematics and the pedagogical content knowledge of a mathematics lecturer. *International Journal of Science and Mathematics Education*, 18, 567-587.
- Dunagan, L., & Larson, D. A. (2021, July). Alignment of competency-based learning and assessment to adaptive instructional systems. In *International Conference on Human-Computer Interaction* (pp. 537-549). Cham: Springer International Publishing.
- Ecclestone, K., & Hayes, D. (2009). Changing the subject: the educational implications of developing emotional well-being. *Oxford Review of Education*, 35(3), 371-389.
- Einaudi, P. (2011). Two decades of increasing diversity more than doubled the number of minority graduate students in science and engineering. InfoBrief: National Center for
- Falola, H. O., Adeniji, A. A., Adeyeye, J. O., Igbinnoba, E. E., & Atolagbe, T. O. (2020). Measuring institutional support strategies and faculty job effectiveness. *Heliyon*, 6(3).
- Fernandes-Osterhold, G. (2022). Diversity and inclusion in integral education: A teaching perspective of integral psychology. *Journal of Transformative Education*, 20(1), 24-43.
- Ford, R., & Meyer, R. (2015). Competency-based education 101. *Procedia Manufacturing*, 3, 1473-1480.
- Foundation.
- Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The internet and higher education*, 7(2), 95-105.
- George, O., Okon, S., & Akaighe, G. (2022). Emotional intelligence and work engagement: A serial mediation model. *Journal of Organizational Effectiveness: People & Performance*, 9(2), 193-211. <https://doi.org/10.1108/JOEPP-02-2021-0025>

- Ghenghesh, P., & Abdelmageed, S. (2018). A study on the effects of staff development on teachers' satisfaction and perceptions of change in teaching performance. *Journal of Education and Practice*, 9(16), 43-49.
- Goleman, D. (2001). Emotional intelligence: Issues in paradigm building. In C. Cherniss & D. Goleman (Eds.), *The emotionally intelligent workplace* (pp. 1-11). Jossey-Bass.
- Gupta, P., Ding, B., Guan, C., & Ding, D. (2024). Generative AI: A systematic review using topic modelling techniques. *Data and Information Management*, 100066.
- Hall, K., Bardier, C., Greer, D., Clayton, A., & Poblete, R. (2024). Unleashing leadership potential in unprecedented times: Lessons learned from an evaluation of a virtual cohort-based adaptive leadership program for public health executives. *Public Health in Practice*, 8, 100532.
- Henri, M., Johnson, M. D., & Nepal, B. (2017). A review of competency-based learning: Tools, assessments, and recommendations. *Journal of engineering education*, 106(4), 607-638.
- Honicke, T., & Broadbent, J. (2016). The influence of academic self-efficacy on academic performance: A systematic review. *Educational research review*, 17, 63-84.
- Honig, M. I., & Rainey, L. R. (2019). Supporting principal supervisors: what really matters?. *Journal of Educational Administration*, 57(5), 445-462.
- Hu, X., Ng, J. T., & Chu, S. K. (2022). Implementing learning analytics in wiki-supported collaborative learning in secondary education: A framework-motivated empirical study. *International Journal of Computer-Supported Collaborative Learning*, 17(3), 427-455.
- Jennings, J. L., & Lauen, D. L. (2016). Accountability, inequality, and achievement: The effects of the No Child Left Behind act on multiple measures of student learning. *RSF: The Russell Sage Foundation Journal of the Social Sciences*, 2(5), 220-241.
- Layard, R. (2007). The teaching of values.
- Louick, R., & Emery, A. (2024). "He understands how I work and how I function": Math teacher actions that promote autonomy among students with LDs and/or EBDs. *Learning Disabilities Research & Practice*, 39(2), 70-86.
- Melzner, N., Dresel, M., & Kollar, I. (2022). Examining the regulation of motivational and comprehension-related problems during collaborative learning. *Metacognition and Learning*, 17(3), 813-836.
- Moss-Racusin, C. A., Pietri, E. S., van der Toorn, J., & Ashburn-Nardo, L. (2021). Boosting the sustainable representation of women in STEM with evidence-based policy initiatives. *Policy Insights from the Behavioral and Brain Sciences*, 8(1), 50-58.
- O'Keefe, M. E. (2017). *Institutional analytics: A response to the pressures of academic capitalism*. The College of William and Mary.
- Okechukwu, W. (2017). INFLUENCE OF TRAINING AND DEVELOPMENT, EMPLOYEE PERFORMANCE ON JOB SATISFACTION AMONG THE STAFF. *Journal of Technology Management and Business*, 4(1).
- Oswald, K., & Taylor, P. (2010). A learning approach to monitoring and evaluation. *IDS Bulletin*, 41(6), 114-120.
- Powell, D. C., & Saint-Germain, M. (2016). Student learning outcome assessment in NASPAA programs: A review of validity and reliability. *Journal of public affairs education*, 22(4), 507-514.
- Primo, N. (2013). NASPAA diversity report 2013. Retrieved from the NASPAA website: <https://naspaaccreditation.hies.wordpress.com/2015/02/diversity-report-10-01-13.pdf>.

- Roe, E. A. (2015). *Converting a traditional engineering technology program to a competency- based, self-paces, open-entry/open-exit/ format*. Paper presented at the ASEE Annual Conference and Exposition, Seattle, WA
- Ruzek, E. A., Hafen, C. A., Allen, J. P., Gregory, A., Mikami, A. Y., & Pianta, R. C. (2016). How teacher emotional support motivates students: The mediating roles of perceived peer relatedness, autonomy support, and competence. *Learning and instruction*, 42, 95-103.
- Sadler, S. (2024). *A canon of collaboration: literary value, student voices and diversity in contemporary studies of literature* (Doctoral dissertation).
- Science and Engineering Statistics [NSF 11–319]. Arlington, VA: National Science
- Seligman, M. E., & Csikszentmihalyi, M. (2000). *Positive psychology: An introduction* (Vol. 55, No. 1, p. 5). American Psychological Association.
- Spady, W. G. (1977). Competency based education: A bandwagon in search of a definition. *Educational researcher*, 6(1), 9-14.
- Strayhorn, T. L. (2012). Diversity Matters: From Rhetoric to Action.
- Strayhorn, T. L. (2018). *College students' sense of belonging: A key to educational success for all students*. Routledge.
- Vashishth, T. K., Sharma, V., Sharma, K. K., Kumar, B., Panwar, R., & Chaudhary, S. (2024). AI-driven learning analytics for personalized feedback and assessment in higher education. In *Using traditional design methods to enhance AI-driven decision making* (pp. 206-230). IGI Global.
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478.
- Voorhees, R. A. (2001). Competency-Based learning models: A necessary future. *New directions for institutional research*, 2001(110), 5-13.
- Voorhees, R. A. (2001). Competency-Based learning models: A necessary future. *New directions for institutional research*, 2001(110), 5-13.
- Walton, E. (2015). *The language of inclusive education: Exploring speaking, listening, reading and writing*. Routledge.
- Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science*, 331(6023), 1447-1451.
- Wasilowski, S. (2018). Employee engagement in higher education: Financial impact of engagement in higher education. *Journal of Social Science Research*, 12(2), 2699–2712. <https://doi.org/10.24297/jssr.v12i2.743>
- Wilson, D. M., Summers, L., & Wright, J. (2020). Faculty support and student engagement in undergraduate engineering. *Journal of Research in Innovative Teaching & Learning*, 13(1), 83-101.
- Wu, F., Wang, T., Yin, D., Xu, X., Jin, C., Mu, N., & Tan, Q. (2023). Application of case-based learning in psychology teaching: a meta-analysis. *BMC Medical Education*, 23(1), 609.