The Role of AI-Driven Mental Health Support in Vocational College Students' Subjective Well-Being

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Abstract – **This study examines the role of AI-driven mental health support in enhancing vocational college students' subjective well-being. Grounded in Social Support Theory, the Stress Buffering Model, and Self-Determination Theory, it develops a conceptual framework explaining how AI-based systems influence emotional, cognitive, and behaviour al dimensions of well-being. Vocational students often face heightened psychological pressure due to academic demands, career uncertainty, and limited access to traditional counselling services. AI-driven mental health tools, such as conversational agents and mobile applications, offer accessible, anonymous, and real-time support, including emotional interaction, cognitive guidance, and behaviour al intervention. These functions help reduce stress, improve coping strategies, and promote psychological need satisfaction. The study further proposes a three-level application model: preventive, intervention, and developmental, to illustrate how AI can be integrated into vocational education systems to support student mental health holistically. Findings suggest that AI-driven support enhances emotional stability, cognitive appraisal, and behaviour al engagement, thereby improving subjective well-being, including life satisfaction and positive affect. The study provides theoretical and practical implications for integrating AI technologies into vocational education while emphasizing the need for ethical governance and responsible implementation.**

Keywords – **AI-Driven, Mental Health, Vocational Education, Subjective Well-Being**

I. INTRODUCTION

In recent years, the mental health and well-being of students have become critical concerns in global educational research and policy. Rapid societal transformation, increasing academic demands, and uncertainties in the labor market have significantly intensified psychological pressures among young people. This issue is particularly pronounced among vocational college students, who often experience lower academic self-efficacy, limited educational resources, and heightened anxiety related to career readiness. According to the World Health Organization (2022), mental health disorders, especially anxiety and depression, are among the leading causes of illness and disability among adolescents and adults worldwide. Recent studies further indicate that college students report increasing levels of stress, emotional distress, and mental health challenges in the post-pandemic era (Son et al., 2020; Wang & Zhao, 2020; Gao et al., 2020), highlighting the urgent need for scalable and accessible support systems within educational environments.

Higher levels of subjective well-being are associated with improved academic engagement, intrinsic motivation, learning persistence, and long-term developmental outcomes. Increasingly, education systems are shifting from performance-oriented models to more holistic approaches that emphasize students' emotional and psychological health. Reports from the Organisation for Economic Co-operation and Development (2021) highlight the importance of integrating social and emotional learning into education systems. Empirical research has also demonstrated that students' well-being is strongly linked to academic success and life satisfaction (Bücker et al., 2018; Widlund et al., 2018), reinforcing the view that promoting subjective well-being is both an educational and developmental priority.

Meanwhile, advances in Artificial Intelligence (AI) have created new opportunities for delivering mental health support in innovative and scalable ways. AI-driven mental health tools, including conversational agents and mobile applications such as Woebot and Wysa, are increasingly used to provide real-time emotional support, cognitive guidance, and behaviour al interventions (Torous et al., 2020; Inkster et al., 2018). These tools offer several advantages, including high accessibility, cost-effectiveness, personalization, and anonymity, which are particularly valuable for students who may be reluctant to seek traditional counselling services due to stigma or limited resources. Recent research suggests that digital and AI-based interventions can effectively expand access to mental health care and improve user engagement (Fitzpatrick et al., 2017; Lattie et al., 2019).

Emerging empirical evidence supports the effectiveness of AI-driven mental health interventions in improving psychological outcomes among young populations. For instance, conversational AI systems have been shown to deliver evidence-based therapeutic approaches, such as cognitive behaviour al techniques, leading to reductions in anxiety and depressive symptoms (Fitzpatrick et al., 2017; Inkster et al., 2018). In addition, systematic reviews and meta-analyses indicate that digital mental health interventions can enhance emotional regulation, perceived social support, and overall well-being among college students (Lattie et al., 2019; Harrer et al., 2019; Domhardt et al., 2019). These findings suggest that AI technologies not only function as mental health tools but also play an increasingly important role in supporting student development within educational contexts.

Despite these promising advancements, existing research has largely focused on general university populations, with relatively limited attention given to vocational college students. This gap is significant, as vocational education

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emphasizes practical skills, applied learning, and career readiness, which may shape students' psychological needs and help-seeking behaviour s differently. Furthermore, the mechanisms through which AI-driven mental health support influences subjective well-being remain insufficiently explored, particularly from an educational and theoretical perspective. Although prior studies have examined digital mental health interventions, few have integrated frameworks such as social support theory, the stress buffering model, and self-determination theory to explain how AI-based support affects student outcomes (Harrer et al., 2019; Lattie et al., 2019; Widlund et al., 2018).

Therefore, this study aims to examine the role of AI-driven mental health support in enhancing vocational college students' subjective well-being. This research seeks to develop a comprehensive framework for understanding how AI technologies contribute to students' emotional well-being and developmental outcomes. The findings are expected to provide both theoretical insights and practical implications for educators, policymakers, and institutions seeking to integrate AI-based support systems into vocational education, ultimately promoting students' holistic development in an increasingly complex and technology-driven society.

Research Questions:

How does AI-driven mental health support influence vocational college students' subjective well-being?

Sub-questions

RQ1: What psychological mechanisms mediate the relationship between AI-driven mental health support and students' subjective well-being?
RQ2: How can AI-driven mental health support be effectively integrated into vocational education contexts to enhance student development?

II. LITERATURE REVIEW

AI-Driven Mental Health Support

With the rapid development of AI technologies, AI-driven mental health support has emerged as an important innovation in addressing students' psychological needs within educational settings. AI-based systems such as conversational agents and mobile applications (e.g., Woebot, Wysa) provide scalable, accessible, and low-cost mental health support services. Compared with traditional counselling services, these systems offer continuous availability, anonymity, and immediate interaction, which are particularly valuable for students who may experience stigma or barriers in help-seeking behaviour (Torous et al., 2020; Abd-Alrazaq et al., 2020; Inkster et al., 2018). Empirical studies have demonstrated that AI-driven interventions can effectively reduce symptoms of anxiety and depression by delivering cognitive-behaviour al strategies and emotional support in real time (Fitzpatrick et al., 2017; Inkster et al., 2018). In addition, systematic reviews suggest that digital mental health tools improve accessibility and engagement among student populations, especially those who are digitally familiar and open to technology-mediated interaction (Harrer et al., 2019; Lattie et al., 2019).

From an educational perspective, AI-driven mental health support is increasingly viewed not only as a clinical tool but also as an integrated component of student support systems. These technologies can be embedded within educational environments to enhance emotional regulation, learning readiness, and adaptive coping behaviour s, thereby contributing to holistic student development (OECD, 2021; Torous et al., 2020; Gao et al., 2020).

Subjective Well-Being in Vocational Education

Subjective well-being (SWB) refers to individuals' cognitive and affective evaluations of their life, including life satisfaction and emotional experiences (Diener et al., 2018). In educational research, SWB has been widely recognized as a key predictor of academic engagement, motivation, and long-term educational success (Bücker et al., 2018; Widlund et al., 2018).

In vocational education, SWB is particularly critical due to the unique psychological pressures faced by students. Vocational college students often experience lower academic self-perception, restricted educational mobility, and high employment-related stress, which may lead to increased anxiety and reduced life satisfaction (Gao et al., 2020; Wang & Zhao, 2020). These challenges make psychological well-being a central factor influencing both academic persistence and career readiness.

Although traditional support systems such as counselling and academic advising contribute to student well-being, they are often limited in accessibility, scalability, and continuity. Therefore, there is an increasing demand for innovative, technology-enhanced support systems that can provide continuous and personalized psychological assistance in vocational education settings (Harrer et al., 2019; Lattie et al., 2019; OECD, 2021).

Research Gap

Despite Despite the growing body of literature on AI-driven mental health support and student well-being, several important research gaps remain. Existing studies have largely focused on general university students, while vocational college students remain underexplored. Given their distinct educational structure and employment-oriented learning environment, vocational students may experience different psychological needs and behaviour al responses to AI-based interventions.

Most previous research emphasizes clinical or symptom-based outcomes, such as reductions in anxiety or depression, rather than broader educational outcomes such as subjective well-being, learning engagement, and student development. This limits the understanding of AI's role within educational systems rather than purely therapeutic contexts. Although several theoretical perspectives have been applied separately, there is still a lack of integrated frameworks that combine Social Support Theory, the Stress Buffering Model, and Self-Determination Theory to explain the mechanisms

through which AI-driven mental health support influences students' subjective well-being. These gaps highlight the need for a comprehensive educational framework that connects psychological theory, digital mental health intervention, and student development outcomes in vocational education contexts.

III. RELEVANT THEORIES

Social Support Theory

Social Support Theory (SST) conceptualizes social support as the perception and availability of assistance from an individual's social network, which plays a critical role in emotional regulation and psychological well-being (House, 1981; Cohen & Wills, 1985). Rather than focusing solely on actual received assistance, contemporary research emphasizes perceived social support as a stronger predictor of mental health outcomes (Lakey & Orehek, 2011; Malecki & Demaray, 2002). Social support is typically categorized into three dimensions: emotional support, informational support, and instrumental support. Emotional support refers to empathy and affective care that help individuals regulate negative emotions. Informational support involves guidance and advice for problem-solving and decision-making. Instrumental support refers to tangible assistance that facilitates coping with practical difficulties (Malecki & Demaray, 2020). In AI-mediated environments, these dimensions can be partially reproduced through system interaction. Conversational agents and digital mental health tools can simulate emotional responsiveness, provide structured informational feedback, and guide behaviour al problem-solving. This suggests that AI systems function as perceived support substitutes, particularly in contexts where human support is limited or inaccessible (Abd-Alrazaq et al., 2020; Inkster et al., 2018).

Stress Buffering Model

The Stress Buffering Model explains how social support reduces the negative psychological impact of stress rather than eliminating stressors themselves (Cohen & Wills, 1985; Lakey & Orehek, 2011). It emphasizes the interaction between environmental demands and individual coping appraisal processes. The model consists of three core components: stressors, perceived stress, and buffering resources. Stressors include academic pressure, career uncertainty, and interpersonal difficulties. Perceived stress refers to individuals' subjective evaluation of these demands. Buffering resources, particularly social support, reduce the intensity of perceived stress or weaken its psychological impact (Ozbay et al., 2007). In higher education, students often experience chronic and cumulative stressors that affect emotional stability and academic functioning (Son et al., 2020; Wang & Zhao, 2020). Vocational students are particularly vulnerable due to employment pressure and skill competitiveness. Recent digital mental health studies extend this model by showing that AI-driven systems can function as continuous buffering resources. These systems provide real-time cognitive reframing, emotional regulation prompts, and adaptive coping strategies, thereby reducing perceived stress and enhancing resilience (Fitzpatrick et al., 2017; Harrer et al., 2019; Lattie et al., 2019).

Self-Determination Theory

Self-Determination Theory (SDT) is a macro theory of human motivation that explains psychological well-being through the satisfaction of three basic psychological needs: autonomy, competence, and relatedness (Deci & Ryan, 1985; Ryan & Deci, 2020). Autonomy refers to the experience of volitional and self-endorsed behaviour . Competence refers to perceived effectiveness in managing challenges. Relatedness refers to the feeling of social connection and emotional belonging (Ryan & Deci, 2020; Reeve, 2012). Need satisfaction is strongly associated with psychological well-being and adaptive functioning, whereas need frustration leads to disengagement and emotional distress (Chen et al., 2015; Howard et al., 2021). In AI-supported environments, these needs can be partially satisfied through system design. Personalized interaction supports autonomy, structured feedback enhances competence, and conversational empathy simulates relatedness. Therefore, AI systems function as digital environments that influence motivational and emotional processes underlying subjective well-being.

Theoretical Synthesis

Although Social Support Theory, the Stress Buffering Model, and Self-Determination Theory originate from different theoretical traditions, they provide complementary perspectives for understanding how AI-driven mental health support influences vocational college students' subjective well-being within educational contexts. Students' well-being is shaped not only by emotional conditions but also by social support systems, stress coping processes, and motivational need satisfaction (Ryan & Deci, 2020; Harrer et al., 2019; Widlund et al., 2018).

From the perspective of external support resources, Social Support Theory explains how AI systems enhance students' perceived emotional and informational support, thereby strengthening their sense of psychological security and emotional connectedness (House, 1981; Cohen & Wills, 1985; Malecki & Demaray, 2020). AI-driven mental health systems, such as conversational agents and digital counselling platforms, can simulate empathic interaction, provide emotional responsiveness, and deliver informational guidance in real time (Abd-Alrazaq et al., 2020; Inkster et al., 2018). For vocational college students, who may experience academic pressure, employment uncertainty, and limited access to psychological counselling, such perceived support can significantly improve emotional adjustment and well-being (Wang & Zhao, 2020; Gao et al., 2020).

From a complementary perspective, the Stress Buffering Model explains how AI-driven support reduces the negative psychological effects of academic and career-related stressors by improving coping capacity and emotional regulation (Cohen & Wills, 1985; Lakey & Orehek, 2011). Rather than eliminating stressors themselves, AI systems function as buffering resources that help students

reinterpret stressful situations and adopt adaptive coping strategies. Empirical studies indicate that AI-based interventions grounded in cognitive-behaviour al principles can effectively reduce anxiety, perceived stress, and depressive symptoms among young adults and college students (Fitzpatrick et al., 2017; Harrer et al., 2019; Lattie et al., 2019). In vocational education settings, where students often face practical skill competition and employment transition pressures, stress-buffering support may play a particularly important role in maintaining emotional stability and learning persistence.

In addition, Self-Determination Theory provides an internal motivational perspective by emphasizing that students' well-being is strongly associated with the satisfaction of three basic psychological needs: autonomy, competence, and relatedness (Ryan & Deci, 2020; Reeve, 2022). AI-driven systems may support autonomy through personalized interaction and self-directed emotional management, enhance competence through adaptive feedback and goal tracking, and strengthen relatedness through continuous conversational engagement (Vansteenkiste et al., 2020; Howard et al., 2021). Recent research further suggests that digital support systems promoting self-regulation and motivational engagement contribute positively to students' psychological functioning and long-term developmental outcomes (Naslund et al., 2020; Lattie et al., 2019).

These three theoretical perspectives form an integrated explanatory framework in which AI-driven mental health support functions as a multi-dimensional educational support system. Through the interconnected mechanisms of perceived social support, stress reduction, and psychological need satisfaction, AI technologies contribute to students' emotional adjustment, self-regulation, resilience, and learning engagement (Harrer et al., 2019; Ryan & Deci, 2020; Widlund et al., 2018). Ultimately, these processes enhance vocational college students' subjective well-being, including life satisfaction, positive emotional experiences, and reduced negative affect (Diener et al., 2018; Bücker et al., 2018).

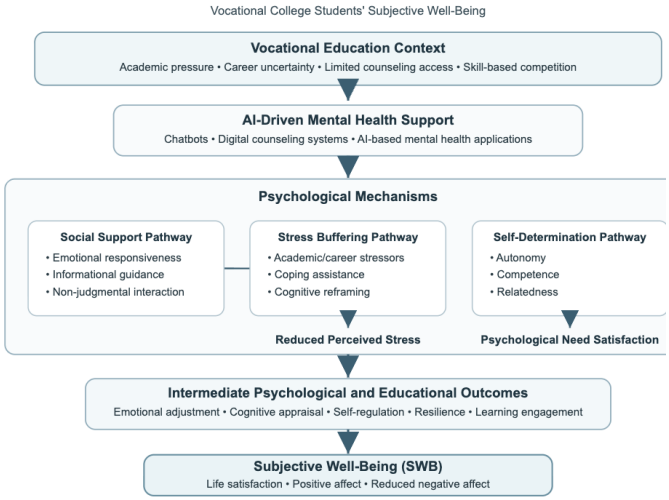


Figure 1. Theoretical Framework of AI-Driven Mental Health Support

IV. EDUCATION FUNCTIONS OF AI-DRIVEN MENTAL HEALTH

AI-driven mental health support in vocational education should be understood as an integrated educational support mechanism rather than a collection of isolated technological functions. Based on Social Support Theory, the Stress Buffering Model, and Self-Determination Theory, this study conceptualizes emotional support, cognitive guidance, and behaviour al intervention as the operational layer through which AI systems influence students' subjective well-being. These educational functions translate psychological mechanisms into practical support processes within vocational education.

Emotional Support Function

The emotional support function refers to AI systems' capacity to provide immediate, accessible, and non-judgmental emotional interaction for students experiencing psychological distress. In vocational education settings, students frequently encounter academic pressure, career uncertainty, and skill-based competition, while traditional counselling services are often constrained by limited accessibility and social stigma. AI-driven conversational systems therefore offer low-threshold emotional support through continuous availability and anonymous interaction.

Empirical studies indicate that AI chatbots and digital counselling systems can reduce symptoms of anxiety and emotional distress by providing empathic communication and psychological reassurance (Bendig et al., 2020; Vaidyam et al., 2019; Laranjo et al., 2018). Recent research further suggests that chatbot-based interventions improve emotional well-being and increase students' willingness to seek psychological support (Firth et al., 2017; Torous et al., 2020). Within educational environments, this function contributes to the development of emotionally supportive learning conditions that enhance students' psychological security and emotional adjustment.

Cognitive Guidance Function

The cognitive guidance function refers to AI systems' ability to facilitate reflective thinking, cognitive restructuring, and adaptive coping. Through structured interaction and conversational scaffolding, AI-driven systems assist students in interpreting academic and vocational challenges more constructively and developing healthier cognitive appraisal patterns. Research demonstrates that AI-supported interventions grounded in cognitive-behaviour al principles can reduce perceived stress and improve coping ability among student populations (Harrer et al., 2019; Karyotaki et al., 2021; Andersson et al., 2019). In vocational education contexts, where students often experience uncertainty regarding employment and future career development, cognitive guidance helps students manage stress more effectively and maintain emotional stability. As an educational function, cognitive guidance supports students' problem-solving capacity, reflective awareness, and psychological resilience within learning environments.

Behaviour al Intervention Function

The behaviour al intervention function refers to the use of AI systems to promote adaptive self-regulation through goal setting, habit tracking, reminders, and feedback mechanisms. This function extends mental health support beyond emotional communication toward sustained behaviour al adjustment and self-management. In addition, AI-driven interventions can strengthen self-regulatory behaviour s, increase positive behaviour al engagement, and improve long-term psychological outcomes (Torous et al., 2020; Linardon et al., 2019; Firth et al., 2017). Through continuous monitoring and personalized feedback, AI systems encourage students to maintain healthier routines, improve time management, and develop adaptive coping behaviour s. In vocational education, where students are expected to develop both technical competence and self-management capacity, behaviour al intervention contributes to long-term career adaptability and learning persistence.

V. APPLICATIONS IN VOCATIONAL EDUCATION

AI-driven mental health support can be implemented in vocational education through a three-level application model consisting of preventive, intervention, and developmental pathways. This staged model reflects the progressive nature of student psychological needs and aligns with research emphasizing scalable and tiered mental health support systems in educational settings (World Health Organization, 2020; UNESCO, 2021; OECD, 2021; Holmes & Tuomi, 2022).

Preventive

The preventive level focuses on early identification of psychological risks and the promotion of emotional awareness within vocational colleges. At this stage, institutions may integrate AI systems into student support platforms to facilitate routine emotional check-ins, psychological self-assessment, and early-warning monitoring mechanisms. Additionally, AI-based systems can identify early signs of anxiety and emotional distress through behaviour al and linguistic indicators, thereby supporting timely preventive intervention (Guntuku et al., 2017; Bendig et al., 2020; Calvo et al., 2017). From an institutional perspective, preventive implementation shifts mental health support from reactive counselling toward proactive well-being management, contributing to psychologically supportive educational environments.

Intervention

The intervention level focuses on providing targeted psychological assistance for students experiencing moderate or severe emotional distress. At this stage, institutions can utilize AI-supported systems to deliver structured interventions such as stress management exercises, guided reflection, and cognitive-behaviour al support. Furthermore, AI-based conversational interventions can effectively reduce anxiety and stress symptoms among student populations (Karyotaki et al., 2021; Andersson et al., 2019; Carlbring et al., 2018). In vocational education settings, such intervention systems are particularly valuable during periods of examination pressure, internship transition, and employment preparation. Compared with traditional counselling services, AI-supported intervention offers greater scalability and accessibility for large student populations.

Developmental

The developmental level emphasizes long-term student growth rather than short-term symptom reduction. At this stage, AI-driven systems support the development of self-regulation, resilience, emotional intelligence, and career adaptability, which are essential competencies in vocational education. Recent studies suggest that sustained engagement with digital mental health systems can improve students' self-management capacity, intrinsic motivation, and adaptive coping behaviour s (Ryan & Deci, 2020; Schueller et al., 2017; Torous et al., 2020). Vocational institutions can therefore integrate AI-supported developmental programs into broader student development initiatives to strengthen students' psychological readiness for lifelong learning and workforce adaptation.

VI. IMPACT ON STUDENTS' SUBJECTIVE WELL-BEING

In vocational education contexts, AI-driven mental health support contributes to students' subjective well-being through emotional well-being, cognitive well-being, and behaviour al engagement.

Emotional Well-Being

AI-driven mental health systems contribute to emotional well-being by reducing negative emotional experiences such as anxiety, stress, and emotional exhaustion. Through empathic interaction and continuous emotional support, AI-based conversational systems provide psychologically safe communication spaces for students. Empirical studies demonstrate that digital mental health interventions can significantly improve emotional regulation and reduce symptoms of anxiety and depression among college students (Firth et al., 2017; Torous et al., 2020; Karyotaki et al., 2021).

Cognitive Well-Being

AI-driven support also enhances cognitive well-being by improving students' cognitive appraisal processes and perceived control over academic and personal challenges. Through structured guidance and reflective interaction, AI systems help students reinterpret stressors more adaptively and reduce maladaptive thinking patterns. Research indicates that AI-supported cognitive-behaviour al interventions can improve coping ability and psychological resilience among young adults (Andersson et al., 2019; Harrer et al., 2019; Linardon et al., 2019).

Behaviour al Engagement

AI-driven mental health support further contributes to behaviour al and academic engagement by promoting self-regulation, time management, and adaptive learning behaviour s. Features such as goal tracking, reminders, and personalized feedback encourage students to maintain positive routines and sustained participation in learning activities. Recent studies suggest that digital support systems can improve self-regulated learning and academic persistence among students (Schueller et al., 2019; Ryan & Deci, 2020; Torous et al., 2020).

VII. DISCUSSION AND IMPLICATIONS

Vocational Vocational colleges should embed AI-driven mental health systems into existing student support infrastructures rather than treating them as supplementary tools. Recent research on digital transformation in education highlights the importance of integrating AI into core institutional systems to enhance student well-being and service accessibility (Zawacki-Richter et al., 2019; Holmes & Tuomi, 2022). By incorporating AI into counselling services, student affairs platforms, and learning management systems, institutions can shift from reactive intervention models toward proactive and preventive mental health support. In particular, AI-enabled analytics can facilitate early identification of at-risk students, enabling timely and targeted intervention.

The integration of AI systems necessitates a reconfiguration of professional roles within vocational education. Rather than replacing educators or counsellors, AI should function as an augmentation tool that enhances human decision-making and service efficiency. Emerging studies emphasize that human–AI collaboration improves both scalability and personalization in student support systems (Zhai et al., 2021; Holmes & Tuomi, 2022). Within this framework, AI systems can handle routine emotional monitoring and low-intensity support, while human professionals focus on complex psychological cases requiring empathy, ethical judgment, and contextual understanding. This division of labor is particularly critical in vocational institutions where mental health resources are often limited.

From a pedagogical perspective, the effective use of AI-driven mental health systems depends on students' level of digital mental health literacy. Without adequate competencies, students may either underutilize available support or develop over-reliance on AI systems. Recent studies suggest that digital literacy, particularly in AI-mediated environments, plays a crucial role in shaping students' engagement and psychological outcomes (Ng et al., 2021). Therefore, vocational institutions should incorporate training on emotional self-regulation, critical AI awareness, and responsible interaction with digital systems into their curricula. Such competencies not only enhance the effectiveness of AI-based support but also prepare students for technology-rich work environments.

Finally, the deployment of AI-driven mental health systems requires robust ethical governance frameworks. Given the sensitivity of psychological data, issues such as privacy protection, informed consent, and algorithmic bias must be carefully addressed. Recent discussions in AI ethics emphasize the need for transparent and accountable data practices in educational contexts (Floridi & Cowls, 2019; Williamson & Eynon, 2020). Institutions must ensure that students are fully informed about how their data are collected and used, while also implementing safeguards to prevent misuse and discrimination. Ethical governance is therefore not an auxiliary concern but a foundational condition for the sustainable application of AI in mental health support.

VIII. LIMIATIONS AND FUTURE DIRECTIONS

This study has several limitations that warrant further investigation. First, the study adopts a conceptual approach and lacks empirical validation. Although the proposed framework is grounded in established theories and supported by recent literature, future research should employ quantitative and mixed-method designs to examine the causal relationships between AI-driven mental health support and students' subjective well-being. Second, this study treats vocational students as a relatively homogeneous group, without fully accounting for individual differences. Future studies should therefore explore these moderating variables to better understand differential outcomes across student populations. Third, while this study emphasizes the positive effects of AI-driven mental health support, it does not extensively address potential risks. Emerging literature highlights concerns related to emotional dependency, over-automation, and algorithmic bias in AI-mediated environments (Baker & Hawn, 2022; Holmes & Tuomi, 2022). Future research should adopt a more balanced perspective by examining both the benefits and unintended consequences of AI integration in mental health education. Finally, rapid advancements in AI technologies suggest the need for continuous theoretical refinement. Future research should incorporate emerging developments such as multimodal affective computing, adaptive learning analytics, and generative AI systems, which may further transform the landscape of digital mental health support in educational contexts.

IX. CONCLUSION

This study has examined the role of AI-driven mental health support in enhancing vocational college students' subjective well-being from an educational perspective. Drawing on Social Support Theory, the Stress Buffering Model, and Self-Determination Theory, it proposed a conceptual framework explaining how AI systems influence emotional well-being, cognitive appraisal, and behaviour al engagement through interconnected mechanisms. The findings indicate that AI-driven mental health support operates as a multi-dimensional educational support system rather than a purely technological tool. By providing emotional assistance, facilitating cognitive restructuring, and promoting behaviour al self-regulation, AI systems contribute to students' overall well-being and developmental outcomes. This is particularly significant in vocational education contexts, where students face unique challenges related to academic pressure and career uncertainty.

Additionally, this study underscores the importance of integrating AI technologies into educational systems in a theoretically informed and ethically responsible manner. The proposed framework not only advances theoretical understanding but also offers practical guidance for institutions seeking to implement AI-based mental health interventions.

In conclusion, AI-driven mental health support represents a promising direction for the future of educational psychology and digital learning environments. By aligning technological innovation with psychological theory and educational practice, vocational institutions can more effectively support students' well-being and foster sustainable development in an increasingly digitalized world.

REFERENCES

Abd-Alrazaq, A. A., Rababeh, A., Alajlani, M., Bewick, B. M., & Househ, M. (2020). Effectiveness and safety of using chatbots to improve mental health: Systematic review and meta-analysis. *Journal of Medical Internet Research, 22*(7), e16021. https://doi.org/10.2196/16021

Andersson, G., Titov, N., Dear, B. F., Rozental, A., & Carlbring, P. (2019). Internet-delivered psychological treatments: From innovation to implementation. *World Psychiatry, 18*(1), 20–28. https://doi.org/10.1002/wps.20610

Baker, R. S., & Hawn, A. (2022). Algorithmic bias in education. *International Journal of Artificial Intelligence in Education, 32,* 1052–1092. https://doi.org/10.1007/s40593-021-00285-9

Bendig, E., Erb, B., Schulze-Thuesing, L., & Baumeister, H. (2020). The next generation: Chatbots in clinical psychology and psychotherapy to foster mental health. *Verhaltenstherapie, 30*(1), 64–76. https://doi.org/10.1159/000501812

Bücker, S., Nuraydin, S., Simonsmeier, B. A., Schneider, M., & Luhmann, M. (2018). Subjective well-being and academic achievement: A meta-analysis. *Journal of Research in Personality, 74,* 83–94. https://doi.org/10.1016/j.jrp.2018.02.007

Calvo, R. A., Milne, D. N., Hussain, M. S., & Christensen, H. (2017). Natural language processing in mental health applications using non-clinical texts. *Natural Language Engineering, 23*(5), 649–685. https://doi.org/10.1017/S1351324916000383

Carlbring, P., Andersson, G., Cuijpers, P., Riper, H., & Hedman-Lagerlöf, E. (2018). Internet-based vs. face-to-face cognitive behaviour therapy for psychiatric and somatic disorders: An updated systematic review and meta-analysis. *Cognitive Behaviour Therapy, 47*(1), 1–18. https://doi.org/10.1080/16506073.2017.1401115

Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E. L., Van der Kaap-Deeder, J., Duriez, B., Lens, W., Matos, L., Mouratidis, A., Ryan, R. M., Sheldon, K. M., Soenens, B., Van Petegem, S., & Verstuyf, J. (2015). Basic psychological need satisfaction, need frustration, and need strength across four cultures. *Motivation and Emotion, 39,* 216–236. https://doi.org/10.1007/s11031-014-9450-1

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310–357. https://doi.org/10.1037/0033-2909.98.2.310

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behaviour* . Plenum.

Diener, E., Oishi, S., & Tay, L. (2018). Advances in subjective well-being research. *Nature Human Behaviour, 2,* 253–260. https://doi.org/10.1038/s41562-018-0307-6

Domhardt, M., Geßlein, H., von Rezori, R. E., & Baumeister, H. (2019). Internet- and mobile-based interventions for anxiety disorders: A meta-analytic review of intervention components. *Depression and Anxiety, 36*(3), 213–224. https://doi.org/10.1002/da.22860

Firth, J., Torous, J., Nicholas, J., Carney, R., Pratap, A., Rosenbaum, S., & Sarris, J. (2017). The efficacy of smartphone-based mental health interventions for depressive symptoms: A meta-analysis of randomized controlled trials. *World Psychiatry, 16*(3), 287–298. https://doi.org/10.1002/wps.20472

Fitzpatrick, K. K., Darcy, A., & Vierhile, M. (2017). Delivering cognitive behaviour therapy to young adults with symptoms of depression and anxiety using a fully automated conversational agent: A randomized controlled trial. *JMIR Mental Health, 4*(2), e19. https://doi.org/10.2196/mental.7785

Floridi, L., & Cowls, J. (2019). A unified framework of five principles for AI in society. *Harvard Data Science Review, 1*(1). https://doi.org/10.1162/99608f92.8cd550d1

Gao, W., Ping, S., & Liu, X. (2020). Gender differences in depression, anxiety, and stress among college students: A longitudinal study from China. *Journal of Affective Disorders, 263,* 292–300. https://doi.org/10.1016/j.jad.2019.11.121

Guntuku, S. C., Yaden, D. B., Kern, M. L., Ungar, L. H., & Eichstaedt, J. C. (2017). Detecting depression and mental illness on social media: An integrative review. *Current Opinion in Behaviour al Sciences, 18,* 43–49. https://doi.org/10.1016/j.cobeha.2017.07.005

Harrer, M., Adam, S. H., Baumeister, H., Cuijpers, P., Karyotaki, E., Auerbach, R. P., Kessler, R. C., Bruffaerts, R., Berking, M., & Ebert, D. D. (2019). Internet interventions for mental health in university students: A systematic review and meta-analysis. *International Journal of Methods in Psychiatric Research, 28*(2), e1759. https://doi.org/10.1002/mpr.1759

Holmes, W., & Tuomi, I. (2022). State of the art and practice in AI in education. *European Journal of Education, 57*(4), 542–570. https://doi.org/10.1111/ejed.12533

House, J. S. (1981). *Work stress and social support.* Addison-Wesley.

Howard, J. L., Bureau, J. S., Guay, F., Chong, J. X. Y., & Ryan, R. M. (2021). Student motivation and associated outcomes: A meta-analysis from self-determination theory. *Perspectives on Psychological Science, 16*(6), 1300–1323. https://doi.org/10.1177/1745691620966789

Inkster, B., Sarda, S., & Subramanian, V. (2018). An empathy-driven, conversational artificial intelligence agent for digital mental well-being: Real-world data evaluation mixed-methods study. *JMIR mHealth and uHealth, 6*(11), e12106. https://doi.org/10.2196/12106

Karyotaki, E., Efthimiou, O., Miguel, C., Bermpohl, F. M. G., Furukawa, T. A., Cuijpers, P., Riper, H., Patel, V., Mira, A., Gemmil, A. W., Yeung, A. S., Lange, A., Williams, A. D., Mackinnon, A., Geraedts, A., van Straten, A., Meyer, B., Björkelund, C., Knaevelsrud, C., & Ebert, D. D. (2021). Internet-based cognitive behaviour al therapy for depression: A systematic review and individual patient data network meta-analysis. *JAMA Psychiatry, 78*(4), 361–371. https://doi.org/10.1001/jamapsychiatry.2020.4364

Lakey, B., & Orehek, E. (2011). Relational regulation theory: A new approach to explain the link between perceived social support and mental health. *Psychological Review, 118*(3), 482–495. https://doi.org/10.1037/a0023477

Laranjo, L., Dunn, A. G., Tong, H. L., Kocaballi, A. B., Chen, J., Bashir, R., Surian, D., Gallego, B., Magrabi, F., Lau, A. Y. S., & Coiera, E. (2018). Conversational agents in healthcare: A systematic review. *Journal of the American Medical Informatics Association, 25*(9), 1248–1258. https://doi.org/10.1093/jamia/ocy072

Lattie, E. G., Adkins, E. C., Winquist, N., Stiles-Shields, C., Wafford, Q. E., & Graham, A. K. (2019). Digital mental health interventions for depression, anxiety, and enhancement of psychological well-being among college students: Systematic review. *Journal of Medical Internet Research, 21*(7), e12869. https://doi.org/10.2196/12869

Linardon, J., Cuijpers, P., Carlbring, P., Messer, M., & Fuller-Tyszkiewicz, M. (2019). The efficacy of app-supported smartphone interventions for mental health problems: A meta-analysis of randomized controlled trials. *World Psychiatry, 18*(3), 325–336. https://doi.org/10.1002/wps.20673

Malecki, C. K., & Demaray, M. K. (2002). Measuring perceived social support: Development of the Child and Adolescent Social Support Scale. *Psychology in the Schools, 39*(1), 1–18. https://doi.org/10.1002/pits.10004

Naslund, J. A., Bondre, A., Torous, J., & Aschbrenner, K. A. (2020). Social media and mental health: Benefits, risks, and opportunities for research and practice. *Journal of Technology in Behaviour al Science, 5,* 245–257. https://doi.org/10.1007/s41347-020-00134-x

Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). Conceptualizing AI literacy: An exploratory review. *Computers and Education: Artificial Intelligence, 2,* Article 100041. https://doi.org/10.1016/j.caeai.2021.100041

Organisation for Economic Co-operation and Development. (2021). *Beyond academic learning: First results from the Survey of Social and Emotional Skills.* OECD Publishing. https://doi.org/10.1787/92a11084-en

Ozbay, F., Johnson, D. C., Dimoulas, E., Morgan, C. A., Charney, D., & Southwick, S. (2007). Social support and resilience to stress: From neurobiology to clinical practice. *Psychiatry, 4*(5), 35–40.

Reeve, J. (2012). A self-determination theory perspective on student engagement. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 149–172). Springer. https://doi.org/10.1007/978-1-4614-2018-7_7

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology, 61,* Article 101860. https://doi.org/10.1016/j.cedpsych.2020.101860

Schueller, S. M., Tomasino, K. N., & Mohr, D. C. (2017). Integrating human support into behaviour al intervention technologies: The efficiency model of support. *Clinical Psychology: Science and Practice, 24*(1), 27–45. https://doi.org/10.1111/cpsp.12173

Son, C., Hegde, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of COVID-19 on college students' mental health in the United States: Interview survey study. *Journal of Medical Internet Research, 22*(9), e21279. https://doi.org/10.2196/21279

Torous, J., Jän Myrick, K., Rauseo-Ricupero, N., & Firth, J. (2020). Digital mental health and COVID-19: Using technology today to accelerate the curve on access and quality tomorrow. *World Psychiatry, 19*(3), 263–264. https://doi.org/10.1002/wps.20781

UNESCO. (2021). AI and education: Guidance for policy-makers. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000376709

Vaidyam, A. N., Wisniewski, H., Halamka, J. D., Kashavan, M. S., & Torous, J. B. (2019). Chatbots and conversational agents in mental health: A review of the psychiatric landscape. *The Canadian Journal of Psychiatry, 64*(7), 456–464. https://doi.org/10.1177/0706743719828977

Vansteenkiste, M., Ryan, R. M., & Soenens, B. (2020). Basic psychological need theory: Advancements, critical themes, and future directions. *Motivation and Emotion, 44,* 1–31. https://doi.org/10.1007/s11031-019-09818-1

Wang, C., & Zhao, H. (2020). The impact of COVID-19 on anxiety in Chinese university students. *Frontiers in Psychology, 11,* Article 1168. https://doi.org/10.3389/fpsyg.2020.01168

Widlund, A., Tuominen, H., & Korhonen, J. (2018). Academic well-being, mathematics performance, and educational aspirations in lower secondary education: Changes within a school year. *Frontiers in Psychology, 9,* Article 297. https://doi.org/10.3389/fpsyg.2018.00297

Williamson, B., & Eynon, R. (2020). Historical threads, missing links, and future directions in AI in education. *Learning, Media and Technology, 45*(3), 223–235. https://doi.org/10.1080/17439884.2020.1798995

World Health Organization. (2020). *Guidelines on mental health promotive and preventive interventions for adolescents: Helping adolescents thrive.* World Health Organization.

World Health Organization. (2022). *World mental health report: Transforming mental health for all.* World

Health Organization. https://www.who.int/publications/i/item/9789240049338

Zawacki-Richter, O., Marín, 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

Zhai, X., Chu, X., Chai, C. S., Jong, M. S. Y., Istenič, A., Spector, M., Liu, J.-B., Yuan, J., & Li, Y. (2021). A review of artificial intelligence in education from 2010 to 2020. *Complexity, 2021,* Article 8812542. https://doi.org/10.1155/2021/8812542