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AI Dependency and Psychological Well-Being: A Review

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ABSTRACT

Artificial Intelligence (AI) has rapidly become an integral component of contemporary academic, professional, and personal life. Generative AI systems, intelligent tutoring platforms, conversational agents, recommendation systems, and automated decision-support tools provide users with unprecedented access to information, personalised assistance, and problem-solving support. At the same time, increasing dependence on AI raises important questions concerning psychological well-being. AI dependency refers to a pattern of excessive or habitual reliance on artificial intelligence for cognitive, academic, emotional, or everyday tasks to the extent that independent functioning may be reduced. This review examines the relationship between AI dependency and psychological well-being, with particular attention to students and young adults. The review synthesises recent literature concerning academic stress, self-efficacy, anxiety, loneliness, emotional well-being, cognitive functioning, social interaction, and independent learning. Existing evidence suggests that moderate and purposeful AI use can improve learning efficiency, reduce task-related stress, provide personalised support, and facilitate access to information. However, excessive reliance may contribute to cognitive offloading, reduced critical and independent thinking, diminished academic self-efficacy, technological dependence, social isolation, and anxiety associated with performance and technology use. Recent empirical research has also identified academic stress and performance expectations as important factors associated with AI dependency. Therefore, the relationship between AI use and psychological well-being should be understood as conditional rather than inherently positive or negative. Responsible AI literacy, self-regulation, human interaction, digital well-being education, and institutional guidelines are essential for maintaining a healthy balance between technological assistance and human autonomy. The review concludes that the central challenge is not eliminating AI use but developing psychologically sustainable patterns of AI engagement.

1. Introduction

Artificial Intelligence has moved from being a specialised technological innovation to becoming an important part of everyday human activity. AI-powered applications are now used for information retrieval, communication, writing, translation, education, decision-making, entertainment, healthcare support, and personal productivity. Generative AI has accelerated this transformation because users can interact with AI systems through natural language and obtain immediate responses to increasingly complex questions.

The educational sector has experienced particularly rapid adoption of AI. Students increasingly use generative AI applications for brainstorming, summarising information, preparing assignments, solving problems, translating texts, generating ideas, and receiving personalised explanations. AI can therefore function as a learning assistant that increases accessibility and efficiency. However, frequent use may gradually change the way individuals approach cognitive tasks.

The distinction between AI use and AI dependency is therefore crucial. Using AI as an occasional or purposeful support mechanism does not necessarily constitute dependency. Dependency emerges when individuals increasingly feel unable or unwilling to perform tasks independently and routinely transfer cognitive, academic, emotional, or decision-making responsibilities to AI systems.

Recent research has specifically examined AI dependency among university students. A study of 300 university students found that academic self-efficacy, academic stress, and performance expectations were associated with AI dependency, while reported negative consequences included reduced creativity and critical and independent thinking. Another study involving 676 university students found significant relationships between academic self-efficacy, academic stress, performance expectations, and AI dependency, with academic stress playing an important mediating role.

Psychological well-being represents another important dimension of this discussion. Psychological well-being encompasses positive functioning, emotional balance, autonomy, meaningful relationships, competence, purpose, and the ability to cope effectively with everyday challenges. AI may contribute to

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some of these dimensions by reducing workload and providing immediate assistance. However, excessive dependence may simultaneously weaken autonomy, confidence, interpersonal engagement, and independent problem-solving.

A recent review of AI and higher-education well-being identified potential benefits including personalised learning and improved communication efficiency, while also highlighting concerns such as digital fatigue, loneliness, technostress, reduced face-to-face interaction, and possible social isolation associated with over-reliance. Thus, understanding AI dependency requires a balanced psychological perspective.

2. Concept of AI Dependency

AI dependency can be conceptualised as a persistent tendency to rely on artificial intelligence for tasks that could reasonably be completed independently. Dependency is not determined merely by the amount of time spent using AI. Rather, it involves the degree of psychological and functional reliance on AI.

AI dependency may include several dimensions:

Cognitive dependency – relying on AI for thinking, reasoning, remembering, analysing, or generating ideas.

Academic dependency – relying on AI for assignments, examination preparation, writing, problem-solving, and learning.

Decision-making dependency – using AI to make choices that could otherwise be made independently.

Emotional dependency – repeatedly turning to AI systems for emotional reassurance or companionship.

Productivity dependency – feeling unable to complete routine tasks without AI assistance.

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Information dependency – accepting AI-generated information without sufficient verification or independent evaluation.

Therefore, AI dependency should not be equated with technological competence. A highly competent AI user may employ AI strategically while maintaining independent judgment. Dependency is more closely associated with diminished autonomy and excessive reliance.

3. Psychological Well-Being: Conceptual Understanding

Psychological well-being is broader than the absence of psychological disorders. It concerns an individual's ability to function effectively, maintain positive relationships, experience purpose, exercise autonomy, develop competence, and regulate emotions.

In the context of AI use, psychological well-being may be considered through the following dimensions:

3.1 Emotional Well-Being

AI can reduce frustration by providing immediate explanations and assistance. However, excessive dependence may create anxiety when AI assistance is unavailable or when individuals become uncertain about their own capabilities.

3.2 Autonomy

Autonomy refers to the capacity to make independent decisions and regulate one's behaviour. Excessive AI dependence may weaken autonomy when individuals habitually outsource decisions to technological systems.

3.3 Competence and Self-Efficacy

Self-efficacy refers to confidence in one's ability to perform tasks successfully. AI can initially increase confidence by providing assistance. However, if individuals consistently outsource difficult tasks, they may have fewer opportunities to develop mastery through independent effort.

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Recent research among university students indicates that AI dependence may be associated with self-efficacy-related problems. A 2025 study reported that generative AI dependency predicted false self-efficacy and was negatively associated with academic achievement among university students.

3.4 Social Relationships

Human psychological well-being depends significantly on meaningful interpersonal relationships. If AI begins to substitute for human interaction, excessive use may potentially contribute to reduced face-to-face communication and social isolation.

3.5 Purpose and Meaning

Education is not merely about obtaining answers. It also involves curiosity, intellectual development, persistence, creativity, and personal growth. Excessive reliance on automated answers may reduce opportunities for meaningful intellectual engagement.

4. Relationship Between AI Dependency and Psychological Well-Being

The relationship between AI dependency and psychological well-being is complex and multidimensional.

4.1 AI as a Source of Psychological Support

AI can provide rapid access to information and assistance. Students experiencing academic difficulties may use AI to clarify concepts, organise study plans, generate practice questions, or obtain feedback. This can reduce uncertainty and task-related stress.

AI systems may also provide conversational support. Emerging literature on AI chatbots suggests potential applications in mental-health support, particularly where students face stigma, cost barriers, or limited access to professional services. However, AI-based support should complement rather than replace qualified mental-health professionals.

4.2 AI Dependency and Academic Stress

Academic pressure is an important factor in AI dependency. Students experiencing high performance

expectations may turn to AI because it offers immediate solutions and reduces the perceived effort required to complete academic tasks.

A recent study involving 676 university students found that academic stress significantly mediated the relationship between academic self-efficacy and AI dependency. The findings suggest that psychological pressures within academic environments may contribute to excessive AI reliance.

This relationship can be conceptualised as:

Low Self-Efficacy → Academic Stress → Greater AI Reliance → Reduced Independent Practice → Potentially Greater Dependency

This does not imply that every student who experiences academic stress becomes dependent on AI. Rather, AI may become particularly attractive when students perceive independent task completion as difficult or threatening.

5. AI Dependency and Self-Efficacy

Self-efficacy is one of the most important psychological variables in understanding AI dependency.

Students with strong academic self-efficacy are generally more likely to believe that they can solve problems through their own efforts. AI may therefore be used as an additional resource rather than a substitute for independent learning.

Conversely, students with lower self-efficacy may use AI as a psychological safety mechanism. When AI produces an answer quickly, it can reduce immediate anxiety. However, repeated outsourcing of difficult cognitive tasks may limit opportunities for mastery.

Recent research has reported a negative association between academic self-efficacy and GenAI dependence and found that academic stress and perceived usefulness of GenAI can mediate this relationship.

This produces an important paradox: AI may increase short-term confidence while potentially weakening long-term independent competence if used excessively.

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6. AI Dependency and Cognitive Functioning

One of the most significant concerns surrounding AI dependency is cognitive outsourcing. Cognitive outsourcing occurs when individuals transfer mental tasks such as remembering, generating ideas, reasoning, or problem-solving to external systems.

A systematic review published in Smart Learning Environments examined over-reliance on AI dialogue systems and identified concerns regarding its effects on students' cognitive abilities.

Excessive cognitive outsourcing may affect:

- Critical thinking
- Independent reasoning
- Problem-solving
- Creativity
- Memory development
- Metacognitive awareness
- Intellectual persistence

However, cognitive outsourcing should not automatically be interpreted as harmful. Humans have always used external cognitive tools such as books, calculators, maps, and search engines. The psychological concern arises when AI becomes a substitute for thinking rather than a tool that supports thinking.

A healthy pattern is therefore:

Human Thinking → AI Assistance → Human Evaluation → Human Decision

An unhealthy pattern is:

Problem → AI Answer → Immediate Acceptance

The difference is the preservation of human judgment.

7. AI Dependency and Anxiety

AI can both reduce and increase anxiety.

Potential anxiety-reducing effects

AI may reduce anxiety by:

- providing immediate clarification;
- assisting with difficult assignments;
- helping students organise their work;
- providing practice opportunities;
- reducing uncertainty;
- supporting personalised learning.

- **Potential anxiety-enhancing effects**

Excessive dependency may produce:

- anxiety when AI is unavailable;
- fear of completing tasks independently;
- uncertainty regarding one's own competence;
- anxiety about academic authenticity;
- concerns about technological change;
- information overload;
- technostress.

Thus, AI's psychological effect depends considerably on how it is integrated into the individual's coping and learning behaviour.

8. AI Dependency and Loneliness

The social dimension of AI dependency deserves greater attention. Conversational AI can simulate interaction and provide immediate responses. For some individuals, this may provide temporary companionship or reduce feelings of isolation.

However, AI interaction cannot completely reproduce reciprocal human relationships. Human relationships involve shared experiences, empathy, emotional reciprocity, non-verbal communication, responsibility, and social development.

A 2025 review of AI and student well-being identified loneliness and reduced face-to-face interaction among concerns associated with extensive AI integration.

Consequently, institutions should encourage students to use AI without allowing it to replace meaningful peer interaction, teacher-student relationships, family relationships, and community participation.

9. AI Dependency and Digital Well-Being

Digital well-being refers to the capacity to use digital technologies in ways that support rather than undermine physical, psychological, social, and academic functioning.

AI dependency can become a digital well-being issue when:

- AI use becomes compulsive;
- individuals cannot complete routine tasks without AI;
- technology interferes with concentration;
- users constantly seek AI reassurance;
- human interaction declines;
- independent learning decreases;
- technological failure causes disproportionate distress.

Digital well-being therefore requires intentionality, self-regulation, boundaries, and critical awareness.

10. Positive Psychological Effects of Appropriate AI Use

Appropriate use of Artificial Intelligence (AI) can positively influence students' psychological well-being when it supports rather than replaces independent thinking. AI can reduce academic stress by providing quick explanations, examples, feedback, and personalised learning support. For example, a

student struggling with a difficult topic can use AI to obtain a simple explanation and then practise independently, reducing frustration and improving confidence.

AI can also strengthen self-efficacy by helping students identify mistakes and improve their performance. Personalised assistance allows learners to progress according to their individual needs and learning pace. Furthermore, AI can encourage creativity by providing brainstorming ideas and alternative perspectives that students can critically evaluate and develop further.

Another important benefit is improved time management. AI can assist with organising study schedules, preparing practice questions, and managing routine academic tasks, thereby reducing unnecessary workload. AI-based accessibility features, including translation, speech-to-text, and text-to-speech, can also promote inclusion and a sense of academic belonging.

Thus, responsible AI use can contribute to reduced stress, greater confidence, personalised learning, creativity, accessibility, and self-regulated learning. However, these benefits are maximised when students maintain human autonomy, critical thinking, and independent decision-making.

11. Negative Psychological Consequences of Excessive AI Dependency

Excessive dependence on Artificial Intelligence (AI) can negatively affect students' psychological well-being, particularly when AI replaces rather than supports independent thinking and learning. One major consequence is reduced self-efficacy. Students who routinely depend on AI to complete academic tasks may gradually lose confidence in their own ability to solve problems independently.

Excessive AI use may also contribute to academic stress and anxiety. Although AI can provide short-term relief from difficult tasks, students may experience anxiety when AI assistance is unavailable or when they are required to perform independently. Continuous dependence can create a psychological belief that successful performance is possible only with technological assistance.

Another concern is cognitive dependency. Constantly obtaining ready-made answers may reduce opportunities to practise critical thinking, problem-solving, creativity, memory, and independent reasoning. For example, a student who always asks AI to write assignments may find it difficult to

organise and express ideas independently.

Excessive interaction with AI may further contribute to social isolation and reduced interpersonal communication if students begin substituting AI interactions for meaningful relationships with teachers, peers, family, and friends. It may also increase technostress and digital fatigue, particularly when individuals feel pressured to continuously use emerging technologies.

Therefore, uncontrolled AI dependency can potentially undermine autonomy, confidence, cognitive engagement, and social connectedness. Responsible AI use should consequently maintain a healthy balance between technological assistance and human independence, critical thinking, emotional regulation, and interpersonal relationships.

12. Theoretical Perspectives

12.1 Self-Determination Theory

Self-Determination Theory emphasises autonomy, competence, and relatedness. AI can support competence by providing assistance, but excessive dependency may threaten autonomy and reduce human relatedness if technological interaction replaces interpersonal relationships.

12.2 Cognitive Offloading Perspective

The cognitive-offloading perspective suggests that individuals naturally use external resources to reduce mental effort. AI represents an exceptionally powerful external cognitive resource. The central issue is whether cognitive offloading complements human thinking or replaces it.

12.3 I-PACE Model

The Interaction of Person-Affect-Cognition-Execution model can help explain problematic technology-related behaviour. Personal characteristics, emotional states, cognitive expectations, and behavioural reinforcement can interact to produce problematic patterns of use.

Recent AI-dependency research has explicitly applied the I-PACE framework to examine relationships among academic self-efficacy, academic stress, performance expectations, and AI dependency.

12.4 Media System Dependency Perspective

The Media System Dependency perspective proposes that individuals become more dependent on media systems when those systems become increasingly important for achieving personal goals. In educational contexts, AI can become particularly influential when students perceive it as essential for academic success.

13. Review of Related Literature

13.1 Zhai, Wibowo, and Li (2024)

Zhai, Wibowo, and Li (2024) conducted a systematic review examining the effects of over-reliance on AI dialogue systems on students' cognitive abilities. Their review highlighted that artificial intelligence can provide rapid access to information, explanations, and problem-solving assistance. However, excessive reliance on AI may reduce opportunities for students to engage in independent reasoning, critical thinking, problem-solving, and creative thinking.

The authors emphasised that the distinction between AI-supported learning and AI-dependent learning is important. When AI is used as a supplementary learning tool, it can facilitate learning; however, when students consistently depend on AI to perform cognitive tasks for them, their independent cognitive engagement may be weakened.

Example: A student may use an AI system to receive an explanation of a difficult concept and then solve related problems independently. This represents constructive AI use. In contrast, if the student asks AI to solve every problem and simply copies the answers without understanding the process, it may contribute to cognitive dependency.

This study is highly relevant to the present review because it establishes a connection between excessive AI reliance and students' cognitive independence, which is an important component of psychological functioning and well-being.

13.2 “Do You Have AI Dependency?” Study (2024)

A study published in the International Journal of Educational Technology in Higher Education examined AI dependency among university students and investigated the roles of academic self-efficacy, academic stress, and performance expectations. The study indicated that students' psychological and academic experiences can influence their tendency to depend on AI technologies.

The findings suggest that students who experience academic pressure or have lower confidence in their academic abilities may be more likely to rely heavily on AI. AI can provide immediate solutions and therefore reduce short-term academic stress. However, repeated reliance may prevent students from developing independent academic skills.

Example: A student who feels anxious about completing an assignment may use AI to generate the entire assignment. The immediate result may be reduced anxiety and greater confidence. However, if this behaviour becomes habitual, the student may gradually feel incapable of completing similar tasks without AI assistance.

This study is particularly relevant to psychological well-being because it demonstrates that academic stress and self-efficacy may be important psychological factors associated with AI dependency.

13.3 Klimova and Pikhart (2025)

Klimova and Pikhart (2025) reviewed the effects of artificial intelligence on student and academic well-being in higher education. Their review identified both positive and negative consequences of AI integration.

On the positive side, AI may facilitate personalised learning, improve communication efficiency, provide academic assistance, and support students in completing difficult tasks. Such benefits may contribute to reduced academic pressure and improved learning experiences.

At the same time, the authors highlighted concerns associated with excessive technological dependence, including digital fatigue, technostress, loneliness, and reduced face-to-face interaction. These factors may have implications for students' psychological and social well-being.

Example: An AI tutor can provide personalised explanations to a student who is struggling with a

particular subject, potentially reducing frustration and academic anxiety. However, if the student begins to use AI instead of communicating with teachers or classmates, opportunities for social interaction and collaborative learning may decline.

The study is therefore important because it presents AI dependency as a multidimensional issue involving not only academic performance but also emotional, psychological, and social well-being.

13.4 Kundu and Bej (2025)

Kundu and Bej (2025) conducted a systematic scoping review of empirical research concerning the psychological impacts of AI use on school students. Their review demonstrated the growing importance of examining AI use from a psychological as well as an educational perspective.

The literature reviewed by the authors indicates that AI can provide students with personalised assistance, learning support, and opportunities for efficient problem-solving. Nevertheless, concerns have emerged regarding excessive use, dependency, reduced autonomy, and possible changes in students' cognitive and psychological functioning.

The study also highlights the importance of considering students' developmental stage when examining the psychological effects of AI. Adolescents may be particularly vulnerable to patterns of excessive technology use because their self-regulation, identity development, and social relationships are still developing.

Example: A school student may use AI to obtain additional explanations after a classroom lesson. This can strengthen understanding. However, if the student starts using AI for every homework question without attempting to solve problems independently, the behaviour may develop into excessive dependence.

This review provides a strong foundation for investigating AI dependency among younger learners and understanding its possible implications for psychological well-being.

13.5 Jia, Pan, and Neary (2025)

Jia, Pan, and Neary (2025) investigated the relationship between generative AI dependency and university students' academic achievement. The study specifically examined the mediating role of self-efficacy and the moderating role of perceived teacher caring.

One important contribution of this study is its discussion of false self-efficacy. Students who successfully complete academic tasks with substantial assistance from generative AI may incorrectly interpret AI-supported performance as evidence of their own independent competence.

This distinction is particularly important for psychological well-being. Genuine self-efficacy develops through personal effort, successful experience, problem-solving, and mastery. If students repeatedly outsource difficult tasks to AI, they may experience high confidence while using AI but reduced confidence when required to work independently.

Example: A student uses generative AI to prepare a high-quality research assignment and receives an excellent grade. The student may conclude that they possess strong research and writing skills. However, when asked to write a similar assignment without AI, the student may struggle significantly. This gap indicates that AI-assisted performance may not always represent genuine independent competence.

The study is therefore highly relevant to the present review because self-efficacy is an important psychological variable connecting AI dependency, academic functioning, and psychological well-being.

13.6 Comparative Summary of the Reviewed Studies

Author/YearMajor FocusMajor FindingsRelevance to Present Study

Author/Year	Major Focus	Major Findings	Relevance to Present Study
Zhai, Wibowo &	AI over-reliance and cognitive	Excessive reliance may affect independent thinking, critical	Connects AI dependency with

Li (2024)	abilities	thinking, and problem-solving	cognitive functioning
AI Dependency Study (2024)	Self-efficacy, academic stress and AI dependency	Academic stress and performance expectations are associated with AI dependency	Connects psychological factors with AI dependency
Klimova &Pikhart (2025)	AI and student well-being	AI offers learning benefits but may also contribute to technostress, loneliness and reduced social interaction	Directly connects AI use with psychological and social well-being
Kundu & Bej (2025)	Psychological effects of AI on school students	AI provides learning support but excessive use raises concerns regarding dependency and autonomy	Extends the discussion to younger learners
Jia, Pan & Neary (2025)	GenAI dependency and academic achievement	AI dependency may be associated with false self-efficacy and academic outcomes	Explains the role of self-efficacy in AI dependency

13.7 Synthesis of the Literature

The reviewed literature demonstrates that the relationship between AI dependency and psychological well-being is complex and multidimensional. The existing studies do not suggest that artificial intelligence is inherently harmful. Rather, they indicate that the pattern and intensity of AI use are important determinants of its consequences.

Appropriate AI use may support students by providing personalised explanations, reducing task-related difficulties, improving accessibility, and facilitating learning. In contrast, excessive dependence may reduce independent cognitive engagement, increase technological reliance, weaken genuine self-

efficacy, and potentially contribute to academic stress, technostress, loneliness, and reduced social interaction.

The literature also suggests that psychological variables such as academic stress and self-efficacy may influence AI dependency. Students who lack confidence in their academic abilities or experience considerable academic pressure may be more likely to use AI as a coping mechanism. Although such use may provide immediate relief, excessive reliance could potentially create a cycle in which students become less confident in their ability to perform tasks independently.

Another important theme emerging from the literature is the distinction between AI-assisted competence and genuine independent competence. A student may perform well with AI assistance but experience difficulty when AI is removed. This possibility has significant implications for self-efficacy, academic development, and psychological well-being.

Overall, the literature indicates that AI should ideally function as a supportive cognitive tool rather than a replacement for human thinking, decision-making, social interaction, and personal effort.

13.8 Research Gap

Although research on AI dependency is expanding rapidly, several gaps remain. First, much of the existing research is cross-sectional and therefore cannot establish whether AI dependency directly causes psychological problems or whether students experiencing stress, low self-efficacy, or anxiety are more likely to become dependent on AI.

Second, existing studies have largely focused on academic performance and cognitive outcomes, while relatively less attention has been given to broader dimensions of psychological well-being, including emotional stability, autonomy, loneliness, resilience, social connectedness, and life satisfaction.

Third, there is a need for more research examining emotional and psychological dependency on conversational AI, particularly among adolescents and young adults.

Finally, more empirical evidence is required from developing countries, including India, where AI adoption in education is increasing rapidly but cultural, socioeconomic, educational, and technological

contexts differ from those of Western countries.

Therefore, further research is needed to develop a comprehensive understanding of how AI dependency influences psychological well-being and which individual, educational, and social factors can protect students from excessive dependence.

14. Conceptual Framework

The relationship between AI dependency and psychological well-being can be represented conceptually as follows:

Individual Factors

↓

Academic Self-Efficacy + Academic Stress + Performance Expectations

↓

AI Usage Pattern

↓

Purposeful AI Use ↔ Excessive AI Dependence

↓

Cognitive and Behavioural Outcomes

Critical Thinking + Independent Learning + Creativity + Self-Regulation

↓

Psychological Outcomes

Self-Efficacy + Anxiety + Stress + Autonomy + Social Connectedness

↓

Overall Psychological Well-Being

This framework highlights that AI itself is not necessarily the independent cause of poor psychological

well-being. Rather, outcomes are influenced by intensity, purpose, context, individual characteristics, and patterns of use.

15. Implications for Educational Institutions

Educational institutions have an important role in preventing unhealthy AI dependency.

15.1 AI Literacy

Students should be taught how AI systems work, what their limitations are, and how to verify AI-generated information.

15.2 Critical Thinking Education

Students should be encouraged to question, evaluate, compare, and improve AI-generated information.

15.3 Independent Learning

Assignments should include activities that require students to demonstrate their own reasoning and reflection.

15.4 Psychological Support

Counsellors and teachers should recognise that excessive technology use may sometimes be associated with academic stress, low self-efficacy, or anxiety.

15.5 Human Interaction

Institutions should preserve collaborative learning, group discussions, peer interaction, mentoring, and teacher-student communication.

15.6 Responsible AI Policies

AI policies should focus not only on academic integrity but also on student well-being, autonomy, privacy, responsible use, and digital citizenship.

16. Strategies for Maintaining Healthy AI Use

A psychologically healthy AI-use model may include the following principles:

1. Think before asking AI.
2. Use AI as an assistant rather than a substitute for thinking.
3. Verify important information.
4. Attempt difficult tasks independently before seeking AI assistance.
5. Maintain regular human interaction.
6. Avoid using AI for every minor decision.
7. Develop self-regulation and time-management skills.
8. Maintain boundaries between AI assistance and emotional dependence.
9. Reflect on whether AI is improving or replacing personal competence.
10. Use AI to learn processes, not merely to obtain answers.

A particularly useful educational principle is:

"AI should augment human intelligence, not replace human agency."

17. Research Gaps

Despite increasing research, several important gaps remain.

First, longitudinal research is required to determine whether AI dependency causes changes in psychological well-being or whether individuals with pre-existing stress and low self-efficacy are more likely to become dependent on AI.

Second, more research is needed on emotional dependency on conversational AI. Academic dependency has received substantially more attention than psychological or emotional dependency.

Third, cross-cultural research is required. Cultural differences may influence attitudes toward technology, education, autonomy, interpersonal relationships, and help-seeking.

Fourth, research should distinguish between different forms of AI dependency. Dependence on AI for academic writing may have different psychological consequences from dependence on AI for emotional support.

Fifth, future studies should investigate protective factors such as teacher support, peer relationships,

self-regulation, digital literacy, and psychological resilience.

Finally, more research is needed among school students, particularly adolescents, because developmental characteristics may influence the relationship between AI use and psychological well-being. A recent scoping review identified 189 eligible empirical studies on psychological impacts of AI among school students, demonstrating the growing but still developing evidence base in this area.

18. Discussion

The reviewed literature suggests that the relationship between AI dependency and psychological well-being is best understood through a balanced-use perspective. AI is neither inherently beneficial nor inherently harmful. Its psychological effects depend on how, why, and to what extent it is used.

Appropriate AI use may improve efficiency, accessibility, learning confidence, and task management. For students, AI can function as a tutor, brainstorming partner, feedback mechanism, and accessibility resource.

The problem emerges when assistance becomes substitution. When individuals stop attempting to remember, reason, create, decide, or communicate independently because AI can perform these activities more quickly, psychological and cognitive consequences may develop.

The relationship between stress and AI dependency is particularly important. Students experiencing academic pressure may use AI to reduce immediate stress. This can create short-term psychological relief. However, if the underlying skills are not developed, dependence may increase over time. The student may then experience lower confidence when AI is unavailable, creating a cycle of dependence.

Similarly, AI can increase self-efficacy when it provides meaningful feedback and scaffolding. However, false confidence may occur when students mistake AI-assisted performance for their own independent competence. Recent evidence concerning GenAI dependency and false self-efficacy reinforces the importance of this distinction.

Therefore, psychological well-being in the age of AI should include not only emotional health but also autonomy, competence, critical thinking, social connectedness, and the ability to function

independently.

19. Conclusion

Artificial Intelligence represents one of the most significant technological developments of contemporary society. Its growing presence in education and everyday life provides substantial opportunities for personalised learning, productivity, accessibility, and psychological support. However, increasing dependence on AI introduces new psychological challenges.

The evidence reviewed in this paper indicates that excessive AI dependency may be associated with academic stress, reduced independent thinking, diminished confidence in independent performance, cognitive outsourcing, social isolation, technostress, and other challenges to psychological well-being. At the same time, moderate and purposeful AI use can support learning, reduce task-related stress, improve accessibility, and increase efficiency.

The central issue is therefore not whether individuals should use AI, but how they should use it. Healthy AI engagement requires maintaining human autonomy, critical thinking, self-regulation, meaningful social relationships, and independent competence.

Educational institutions should consequently move from a simple "AI acceptance versus AI rejection" debate toward a model of responsible and psychologically sustainable AI integration. Students should be taught to use AI as a tool for enhancing human capabilities rather than as a replacement for human thought and agency.

Future research should employ longitudinal, experimental, cross-cultural, and mixed-method approaches to examine the long-term psychological consequences of AI dependency. Particular attention should be given to emotional dependence, adolescent users, academic self-efficacy, loneliness, anxiety, and the protective role of teacher and peer support.

Ultimately, the goal of digital well-being in the age of artificial intelligence should be to ensure that technology remains a means of human development rather than becoming a substitute for human autonomy, relationships, and psychological resilience.

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