

## Article

# Design and Practice of Integrating Mental Health Education into High School Biology Teaching

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**Abstract:** This study examines the design and practical implementation of integrating mental health education into high school biology teaching. By linking biological concepts such as the nervous system, endocrine system, and immune system with psychological themes including stress recognition, emotional awareness, and relaxation strategies, the approach aims to enhance both students' scientific understanding and psychological awareness. The curriculum emphasizes activities that are feasible within standard classroom settings, such as case discussions, reflection exercises, group problem-solving, and brief mindfulness practices. These activities are designed to foster cognitive engagement while providing opportunities for students to relate biological knowledge to their personal experiences. The study also considers practical challenges, including the need to balance core biology content with mental health objectives, variability in student receptivity to psychological topics, and the limitations of assessing psychological outcomes in a classroom context. By addressing these challenges, the curriculum offers a realistic and implementable model for combining scientific instruction with mental health education. Overall, the integration demonstrates a practical pathway for promoting holistic learning, encouraging critical thinking, and supporting students' emotional well-being alongside their academic development. This research provides guidance for educators seeking to design student-centered lessons that merge cognitive and emotional learning in secondary education.

**Keywords:** high school biology; mental health education; integrated curriculum; student-centered learning; cognitive-emotional development

## 1. Introduction

In recent years, the mental health of high school students has attracted increasing attention from educators, parents, and policymakers. Academic pressure, peer competition, and the challenges of adolescence have made psychological well-being a pressing issue in secondary education. Traditional approaches to mental health education in schools often rely on separate courses or counseling services, which are valuable but sometimes limited in their reach and effectiveness. Integrating psychological support into regular subject teaching may provide a more sustainable and accessible way of nurturing students' resilience and emotional awareness. Among various disciplines, biology is particularly well positioned to play this role. As a subject centered on life and health, it naturally connects with themes such as stress regulation, hormonal changes, and the physiological basis of emotions. Teaching biology with explicit attention to students' psychological needs not only deepens their understanding of scientific knowledge but also helps them link abstract concepts to their personal experiences. For instance, lessons on the nervous system can be enriched by discussing how stress affects sleep and concentration, while discussions on the endocrine system can lead to reflections on mood swings and self-identity during adolescence. Such connections encourage students to view biology not only as an academic subject but also as a resource for coping with real-life challenges.

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This paper aims to explore how mental health education can be effectively embedded into biology teaching in high school contexts. Drawing on theoretical insights from life education, constructivism, and positive psychology, it outlines a teaching design that integrates psychological awareness with scientific learning. Furthermore, it presents practical experiences from classroom implementation, highlighting both achievements and limitations. In doing so, the study seeks to provide a feasible model for interdisciplinary teaching that addresses the dual goals of academic progress and psychological well-being [1-3].

## **2. Foundations of Mental Health Integration**

### *2.1. Life Education Theory*

Life education theory emphasizes cultivating respect for life, understanding its meaning, and fostering an attitude of care toward oneself and others. At the high school level, this perspective resonates strongly with the subject of biology, which is itself centered on the study of life processes and human health. By integrating the principles of life education into biology instruction, teachers can move beyond the transmission of abstract scientific facts and create opportunities for students to reflect on the relevance of biological knowledge to their own well-being. For example, discussions of cellular metabolism or the nervous system can be linked to everyday concerns such as fatigue, stress, or concentration. When students recognize that the biological mechanisms they study are directly connected to their own emotional experiences, they are more likely to value both the scientific content and the broader message of caring for life [4-7].

In the context of mental health education, life education provides a framework for helping students see psychological challenges as part of the broader human experience. Stress, anxiety, and emotional fluctuations are not presented merely as problems to be eliminated, but as natural responses that can be understood through biological principles and managed with healthy strategies. This perspective encourages students to adopt a balanced attitude toward setbacks, to respect the limits of their own physical and psychological resources, and to recognize the importance of seeking help when necessary. Importantly, the application of life education in biology classes does not require radical changes to the curriculum or advanced technologies. Rather, it depends on subtle shifts in teaching focus—for instance, framing lessons on the endocrine system not only around hormone regulation but also around the implications for adolescent development and emotional adjustment. In this way, life education theory provides a realistic and feasible foundation for integrating mental health education into high school biology classrooms.

### *2.2. Constructivist Learning Theory*

Constructivist learning theory views knowledge not as something passively absorbed but as actively built through learners' engagement with content and experiences. This perspective is particularly valuable when integrating mental health education into biology, because students are more likely to internalize both scientific concepts and psychological insights when they can connect them with their own daily lives. In a traditional classroom, lessons on the nervous system might remain at the level of diagrams and definitions, but a constructivist approach would encourage students to relate these mechanisms to familiar situations such as the rapid heartbeat before an exam or the difficulty of falling asleep after prolonged screen time. By making these personal connections, students not only gain a deeper grasp of physiological processes but also develop an awareness of how such processes influence their emotions and behavior [8,9].

From the standpoint of mental health, constructivism highlights the importance of allowing students to explore their own interpretations rather than imposing uniform conclusions. When discussing the endocrine system, for instance, teachers can invite students to share how mood changes or stress affect their concentration, and then guide them to understand the biological basis of these experiences. Such activities do not demand ad-

vanced resources or excessive class time; they simply require teachers to structure questions and tasks that link textbook content with personal reflection. In this way, the classroom becomes a space where students construct not only knowledge about life sciences but also practical strategies for managing their well-being. The integration remains grounded in everyday teaching practice, achievable within the existing curriculum, while giving students greater agency in relating biology to their psychological growth.

### *2.3. Positive Psychology*

Positive psychology emphasizes the cultivation of strengths, optimism, and resilience rather than focusing solely on problems or deficits. In the context of high school biology education, this theoretical perspective offers a practical way to encourage students to recognize and build upon their existing capabilities while understanding the biological mechanisms underlying emotions and behavior. For example, lessons on the immune system or stress response can incorporate discussions on how positive emotional states, such as gratitude or social support, can influence physical health. By highlighting these connections, teachers help students appreciate the interplay between biological processes and psychological well-being, reinforcing the relevance of scientific knowledge to their own lives.

Importantly, integrating positive psychology into the classroom does not necessitate extensive restructuring or complex interventions. Simple strategies, such as prompting students to reflect on coping strategies after a challenging task or sharing examples of adaptive responses to stress, allow mental health concepts to be woven into the existing biology curriculum. In addition, discussions of resilience and adaptive coping can be naturally linked to topics like neural plasticity or hormone regulation, demonstrating to students that both challenges and growth are part of normal human development. These approaches emphasize realistic, attainable steps rather than idealized outcomes, ensuring that students experience tangible benefits without imposing impractical expectations on teachers or schools.

By combining positive psychology with life education and constructivist principles, biology instruction can support not only cognitive understanding but also emotional and psychological development. This theoretical synergy provides a solid and feasible foundation for designing lessons that foster both scientific literacy and mental health awareness, demonstrating that interdisciplinary integration is both meaningful and practically achievable within a typical high school setting.

## **3. Teaching Design and Integration**

### *3.1. Teaching Objectives and Principles*

The primary aim of integrating mental health education into high school biology teaching is to create a learning environment where students can simultaneously develop scientific understanding and psychological awareness. Rather than treating mental health as a separate topic, this approach seeks to embed it within the study of biological processes, allowing students to connect abstract concepts with their own emotional and physical experiences. For instance, while learning about the nervous system, students can explore how stress responses influence attention and memory, helping them recognize the physiological basis of common psychological states. Similarly, lessons on the endocrine system provide opportunities to discuss hormonal influences on mood and behavior, particularly during adolescence [10].

In terms of learning objectives, this integrated approach emphasizes not only the acquisition of biological knowledge but also the development of analytical skills and emotional literacy. Students are encouraged to critically examine the interactions between physiological mechanisms and mental well-being, fostering both intellectual engagement and personal insight. The approach also underscores the cultivation of balanced attitudes toward stress, self-care, and interpersonal relationships. By framing mental health within

the context of life sciences, teachers can guide students to understand challenges as natural and manageable, rather than exceptional or overwhelming.

From a practical perspective, these objectives are grounded in the realities of typical high school classrooms. The design does not rely on advanced technology or extensive resources; rather, it leverages everyday teaching materials and activities, such as case discussions, short reflective exercises, and classroom observations. This ensures that the integration of mental health content remains achievable for teachers while still promoting meaningful student engagement. Overall, the principles guiding this teaching design emphasize relevance, accessibility, and incremental impact, aiming to support students' cognitive and emotional development in a balanced and realistic manner [11].

### *3.2. Content Selection and Strategies*

The selection of teaching content in high school biology is central to the successful integration of mental health education. Topics are chosen not only for their scientific significance but also for their relevance to students' daily experiences and psychological development. Core areas such as the nervous system, the endocrine system, and the immune system provide natural entry points for discussions about stress, emotional regulation, and the physiological basis of well-being. For example, when studying the nervous system, teachers can introduce the effects of stress hormones on attention and memory, encouraging students to reflect on how these processes affect their own academic performance. Similarly, the study of the endocrine system offers opportunities to explore mood swings, energy levels, and adolescent behavioral patterns, connecting biological knowledge to personal development. Lessons on immunity can include discussions on how chronic stress may impact health, providing students with tangible examples of the mind-body connection [12].

In terms of instructional strategies, emphasis is placed on creating interactive and reflective learning experiences. Contextual scenarios drawn from everyday student life, such as exam anxiety or peer pressure, can serve as starting points for inquiry-based discussions, linking theoretical knowledge to concrete situations. Group activities, collaborative problem-solving, and hands-on experiments further reinforce the integration of scientific and psychological insights. Additionally, brief in-class exercises aimed at relaxation or mindful awareness, such as guided breathing or short reflection periods, allow students to experience practical techniques for managing stress without requiring extensive class time or specialized resources. These activities are designed to be seamlessly incorporated into standard lessons, ensuring that the integration of mental health concepts remains realistic and sustainable.

Overall, content selection and instructional strategies are guided by the principle of relevance and applicability. By choosing topics that naturally intersect with students' emotional and cognitive experiences and employing strategies that encourage reflection, discussion, and practice, teachers can facilitate learning that is both scientifically rigorous and psychologically supportive. This approach prioritizes attainable classroom practices, reinforcing the idea that mental health education can be meaningfully embedded within existing biology curricula without imposing unrealistic demands on students or educators.

### *3.3. Assessment and Evaluation*

Assessment in an integrated biology and mental health curriculum is designed to capture both cognitive understanding and students' emerging psychological awareness. Rather than relying solely on traditional examinations, this approach emphasizes ongoing, formative evaluation that reflects students' engagement with the material and their ability to apply knowledge in meaningful ways. Classroom participation, reflective journals, and peer discussions serve as tools for teachers to gauge not only comprehension of biological concepts but also students' understanding of the connections between physiology and emotional well-being. These methods provide real-time feedback, allowing teachers to

adjust instruction according to students' needs and to reinforce both scientific and psychological learning objectives.

Summative assessment is also incorporated, focusing on projects and integrative tasks that encourage students to demonstrate their understanding holistically. For instance, students might complete a case study analyzing the physiological and psychological factors influencing stress, or design a small experiment to explore how lifestyle factors affect biological responses. These activities encourage critical thinking, personal reflection, and the application of theoretical knowledge to practical scenarios. Importantly, all assessments are designed to be achievable within typical high school classroom conditions, avoiding excessive demands on teachers or students while still providing meaningful insights into learning outcomes [13].

In addition to academic performance, assessment considers the development of psychological skills such as self-awareness, stress management, and resilience. While these outcomes are more difficult to quantify, observable behaviors—such as participation in discussion, engagement in reflective exercises, and responses to classroom scenarios—offer valuable indicators of progress. By combining formative and summative approaches, the assessment framework supports a balanced evaluation of both knowledge acquisition and psychological growth, reinforcing the overall objectives of the integrated teaching design. This approach demonstrates that effective evaluation is not only feasible in ordinary classroom settings but also essential for ensuring that mental health education is meaningfully connected to the study of biology.

#### **4. Classroom Implementation and Student Interaction**

##### *4.1. Lesson Execution*

The implementation of the integrated biology and mental health curriculum was carried out in a typical high school classroom setting, aiming to translate the theoretical framework and teaching design into concrete practice. Lessons focused on key units such as the nervous system, endocrine system, and immune system, which naturally lend themselves to discussions about stress, mood regulation, and overall well-being. Teachers began each lesson by situating biological content within familiar contexts, for example, by discussing how stress hormones affect attention during exams or how sleep patterns influence learning efficiency. These introductions provided a bridge between abstract scientific concepts and students' personal experiences, making the content both relevant and engaging [14].

Instructional activities were designed to be interactive yet feasible within regular class periods. Case discussions, group problem-solving, and short reflection exercises allowed students to apply their understanding of biological mechanisms to real-life scenarios. For instance, when exploring the endocrine system, students analyzed everyday situations involving emotional fluctuations, linking hormonal changes to observable behaviors. Short in-class relaxation exercises, such as guided breathing or mindful awareness, were incorporated to provide practical strategies for stress management without requiring extensive resources or specialized equipment. These activities were deliberately kept brief and simple, ensuring that they could realistically fit within the existing curriculum and classroom schedule.

Teachers emphasized a supportive and flexible approach, encouraging students to share observations and reflections while maintaining sensitivity to individual differences in psychological readiness and comfort levels. Classroom dialogue was guided rather than scripted, enabling students to construct their own understanding of the interactions between biological processes and mental health. Throughout the lessons, teachers observed students' engagement and adjusted pacing, activity intensity, and discussion prompts accordingly.

Overall, the lesson execution demonstrates that integrating mental health concepts into biology teaching is achievable in everyday classroom contexts. By grounding activities in observable phenomena and students' lived experiences, the implementation remained practical, relevant, and adaptable, avoiding overly idealized expectations while fostering both scientific comprehension and psychological awareness. This approach provides a foundation for evaluating student engagement and outcomes, which will be discussed in the following section [15].

#### 4.2. Student Engagement and Interaction

In the implementation of the integrated biology and mental health curriculum, student engagement played a central role in both learning outcomes and the practical application of psychological concepts. Classroom activities were designed to be interactive, encouraging students to connect biological knowledge with their personal experiences. For example, during lessons on the nervous system, students participated in case discussions analyzing stress responses in academic scenarios, while reflection exercises encouraged them to consider how their own behaviors and emotional reactions related to the biological processes under study. These activities fostered critical thinking and self-awareness, creating a learning environment where cognitive understanding and emotional insight developed simultaneously [16,17].

Teachers observed variations in engagement across different activity types. Group discussions and collaborative problem-solving were particularly effective in prompting students to articulate their thoughts and share personal experiences, whereas brief mindfulness or guided breathing exercises provided practical experience in stress management. Classroom observations and informal feedback indicated that students were able to relate the scientific concepts to their own mental health, demonstrating an increased awareness of the interaction between physiology and psychology [18,19].

The main classroom activities, their integration with mental health education, and intended learning outcomes are summarized in Table 1:

**Table 1.** Integrated Classroom Activities for Biology and Mental Health.

Lesson Topic	Activity	Mental Health Integration	Purpose / Learning Outcome
Nervous System	Case discussion	Stress recognition and response	Students connect biological mechanisms to everyday stress
Endocrine System	Reflection exercise	Emotional awareness	Encourage students to reflect on how hormones affect mood
Immune System	Group experiment	Mind-body connection	Explore how physiological processes relate to well-being
General	Mindfulness / Breathing exercise	Relaxation and self-regulation	Practice simple techniques to manage short-term stress

Following the presentation of Table 1, it is clear that the classroom activities were designed to balance cognitive learning with psychological awareness. Each activity intentionally links biological content to practical aspects of mental health, allowing students to apply scientific concepts to their own experiences. This approach demonstrates that integrating mental health education into biology lessons is feasible within standard classroom conditions, providing both academic and emotional benefits without requiring extraordinary resources or idealized interventions. These observations set the stage for the next section, where teacher reflections and subsequent adjustments to classroom activities are discussed.

#### *4.3. Analysis and Practical Considerations*

While the implementation of integrated biology and mental health lessons offers promising opportunities, certain practical considerations must be acknowledged to ensure feasibility and effectiveness. One key aspect is the balance between scientific content and mental health topics. Biology lessons have defined curricular requirements, and the inclusion of psychological elements must be carefully framed so as not to compromise essential scientific objectives. Integrating mental health concepts is most feasible when they naturally align with biological content, such as stress responses in the nervous system or hormonal influences in the endocrine system.

Another consideration is the design of classroom activities. Interactive discussions, reflection exercises, and brief mindfulness practices can enhance engagement and psychological awareness, but their duration and complexity must fit within the standard class schedule. Activities should require minimal resources, be easily understood by students, and avoid overcomplicating the lesson. This ensures that the integration remains practical and does not impose unrealistic demands on either teachers or students [20].

Additionally, the classroom environment and student readiness influence the success of integration. Teachers may need to introduce mental health topics gradually, using contextually relevant examples that students can relate to without feeling pressured. Clear instructions and structured prompts can help maintain focus and ensure that the psychological aspects complement rather than distract from core biology content.

Overall, these considerations highlight the importance of a realistic, incremental approach to integrating mental health education into high school biology. Rather than relying on hypothetical outcomes or idealized scenarios, the focus should be on designing lessons that are implementable within typical classroom conditions, maintain scientific rigor, and provide opportunities for students to reflect on the relationship between biological mechanisms and their own well-being. This analytical perspective lays the groundwork for understanding the broader applicability and limitations of the integrated curriculum, bridging the gap between theoretical design and practical implementation.

### **5. Advantages, Limitations, and Practical Implications**

Integrating mental health education into high school biology offers several clear advantages. First, it allows students to connect abstract scientific concepts to their personal experiences, enhancing relevance and engagement. For instance, lessons on the nervous system, endocrine system, or immune system can be naturally linked to topics such as stress, mood regulation, and the mind-body connection. This contextualization not only reinforces cognitive understanding but also introduces students to fundamental aspects of psychological awareness, supporting the development of self-regulation and reflective thinking.

Second, the integration fosters holistic learning by combining cognitive and emotional dimensions. Traditional biology instruction often focuses solely on content acquisition and memorization, which may overlook students' psychological needs. By incorporating mental health considerations, teachers encourage students to reflect on their own experiences in relation to biological processes, cultivating critical thinking and personal insight. This approach aligns with contemporary educational goals that emphasize the development of well-rounded learners who are not only knowledgeable but also emotionally aware and capable of applying learning to everyday life.

Third, the integration is feasible within standard classroom settings. Activities such as case discussions, reflection exercises, and brief mindfulness practices require minimal resources, can be implemented within regular class periods, and do not necessitate specialized equipment or external expertise. The design emphasizes practicality, ensuring that lessons remain manageable for teachers while still offering meaningful opportunities for students to engage with both biological content and psychological concepts.

Despite these advantages, several limitations must be acknowledged. One key limitation is the variability in student readiness and receptivity to psychological topics. Not all students may feel comfortable discussing personal experiences or engaging in reflection exercises, which can influence the depth of engagement. Teachers must therefore employ flexible strategies that accommodate differing levels of participation and maintain a respectful and supportive classroom environment.

Another limitation concerns the balance between scientific content and mental health education. Integrating psychological elements must be done carefully to avoid reducing instructional time for essential biology content. Overemphasis on mental health topics could compromise coverage of the standard curriculum, which is particularly important in contexts where examination performance is a priority. Designing activities that seamlessly link biology with psychological awareness without detracting from core objectives remains a challenge.

Additionally, assessment and evaluation of the integrated curriculum present practical challenges. While cognitive understanding can be measured through conventional assessments, evaluating psychological outcomes such as stress awareness or emotional reflection is inherently more subjective. Teachers may rely on observable behaviors, participation in discussions, or reflective writings, but these indicators cannot fully capture students' internal experiences. Thus, assessment strategies must be designed with caution, focusing on achievable objectives while acknowledging inherent limitations.

In terms of practical implications, the integration encourages a more student-centered approach to biology instruction. Teachers are prompted to design lessons that are interactive, contextually relevant, and responsive to students' emotional and cognitive needs. This may lead to broader educational benefits, such as improved engagement, enhanced critical thinking, and greater awareness of the interaction between physiological processes and psychological states. The approach also underscores the importance of teacher training, as educators need both subject knowledge and an understanding of basic psychological principles to implement the integrated curriculum effectively.

In conclusion, while the integration of mental health education into high school biology presents clear pedagogical advantages and is achievable within typical classroom settings, it is accompanied by realistic limitations. Variability in student receptivity, the challenge of balancing curriculum content, and the subjective nature of psychological assessment must all be considered in lesson design. Nevertheless, by emphasizing practical, achievable strategies, this approach offers meaningful opportunities for enhancing both scientific understanding and students' psychological awareness, laying the foundation for a more holistic educational experience.

## **6. Conclusion**

This study explored the design and practical implementation of integrating mental health education into high school biology lessons. By aligning biological concepts with psychological themes such as stress recognition, emotional awareness, and relaxation techniques, the curriculum demonstrates a feasible approach to fostering both cognitive understanding and psychological awareness among students. The integration leverages naturally related topics within biology, ensuring that mental health considerations complement rather than compete with essential scientific content.

The analysis highlights several key benefits of this integrated approach. First, it enhances the relevance of biology lessons by connecting abstract scientific concepts to students' personal experiences, fostering engagement and deeper understanding. Second, it promotes holistic learning, combining cognitive and emotional dimensions, and encouraging students to reflect on the interplay between physiological mechanisms and their own well-being. Third, the approach is practical and achievable within standard classroom conditions, relying on activities that require minimal resources while supporting interactive and student-centered learning.



At the same time, the study acknowledges realistic limitations. Variability in student receptivity to psychological topics, the need to maintain a balance between curriculum content and mental health objectives, and the subjective nature of assessing psychological outcomes all pose challenges that must be carefully considered in lesson planning. These limitations underscore the importance of flexible activity design, clear instructional guidance, and teacher preparedness in delivering the integrated curriculum effectively.

In practical terms, the integration of mental health education into biology teaching provides a model for fostering both scientific literacy and psychological awareness without relying on hypothetical outcomes or idealized scenarios. It encourages teachers to adopt a reflective and adaptive approach to lesson design, considering students' cognitive and emotional needs while remaining within the realistic constraints of typical high school classrooms.

In conclusion, integrating mental health education into biology lessons is both feasible and beneficial when approached with careful planning, contextual relevance, and achievable objectives. This approach lays the groundwork for more holistic and student-centered teaching practices, supporting not only academic development but also the cultivation of students' emotional well-being, self-awareness, and ability to apply scientific knowledge in meaningful, real-life contexts.

## References

1. K. E. MacDuffie and T. J. Strauman, "Understanding our own biology: The relevance of auto-biological attributions for mental health," *Clin. Psychol.: Sci. Pract.*, vol. 24, no. 1, p. 50, 2017, doi: 10.1037/h0101741.
2. W. T. Blows, *The biological basis of mental health*. London, UK: Routledge, 2021. ISBN: 9781003097273.
3. S. Turner, K. Öberg, and G. Unnerstad, "Biology and health education," *Eur. J. Teach. Educ.*, vol. 22, no. 1, pp. 89-100, 1999, doi: 10.1080/0261976990220107.
4. S. Kutcher, Y. Wei, A. McLuckie, and L. Bullock, "Educator mental health literacy: A programme evaluation of the teacher training education on the mental health & high school curriculum guide," *Adv. Sch. Ment. Health Promot.*, vol. 6, no. 2, pp. 83-93, 2013, doi: 10.1080/1754730X.2013.784615.
5. Y. Wei, S. Kutcher, H. Hines, and A. MacKay, "Successfully embedding mental health literacy into Canadian classroom curriculum by building on existing educator competencies and school structures: The mental health and high school curriculum guide for secondary schools in Nova Scotia," *Lit. Inf. Comput. Educ. J.*, vol. 5, no. 3, pp. 1649-1654, 2014, doi: 10.20533/licej.2040.2589.2014.0220.
6. C. W. Mohler, "High School Biology and Mental Hygiene," *Sch. Sci. Math.*, vol. 50, no. 9, pp. 713-724, 1950, doi: 10.1111/j.1949-8594.1950.tb06759.x.
7. R. Milin, S. Kutcher, S. P. Lewis, S. Walker, Y. Wei, N. Ferrill, and M. A. Armstrong, "Impact of a mental health curriculum on knowledge and stigma among high school students: A randomized controlled trial," *J. Am. Acad. Child Adolesc. Psychiatry*, vol. 55, no. 5, pp. 383-391, 2016, doi: 10.1016/j.jaac.2016.02.018.
8. Y. Zhou, "Integrate STEM education into biology teaching," in *Proc. 3rd Int. Conf. Ment. Health, Educ. Hum. Dev. (MHEHD 2022)*, Atlantis Press, Jul. 2022, pp. 357-360, doi: 10.2991/assehr.k.220704.066.
9. Z. Zhan and S. Niu, "Subject integration and theme evolution of STEM education in K-12 and higher education research," *Hum. Soc. Sci. Commun.*, vol. 10, no. 1, pp. 1-13, 2023, doi: 10.1057/s41599-023-02303-8.
10. B. Korma, et al., "Integrating One Health into High School teaching: A Practical Guide for Teachers," 2024.
11. K. Chamany, D. Allen, and K. Tanner, "Making biology learning relevant to students: integrating people, history, and context into college biology teaching," *CBE Life Sci. Educ.*, vol. 7, no. 3, pp. 267-278, 2008, doi: 10.1187/cbe.08-06-0029.
12. J. M. Heyes and B. Billingsley, "The role of biology teachers in epistemically insightful health and wellbeing education: a case study of the English relationships, sex and health education curriculum," *J. Biol. Educ.*, vol. 58, no. 5, pp. 1090-1102, 2024, doi: 10.1080/00219266.2022.2157860.
13. Y. Machluf and A. Yarden, "Integrating bioinformatics into senior high school: design principles and implications," *Brief. Bioinform.*, vol. 14, no. 5, pp. 648-660, 2013, doi: 10.1093/bib/bbt030.
14. A. Pluskota, "The application of positive psychology in the practice of education," *SpringerPlus*, vol. 3, no. 1, p. 147, 2014, doi: 10.1186/2193-1801-3-147.
15. S. Coulombe, K. Hardy, and R. Goldfarb, "Promoting wellbeing through positive education: A critical review and proposed social ecological approach," *Theory Res. Educ.*, vol. 18, no. 3, pp. 295-321, 2020, doi: 10.1177/1477878520988432.
16. P. H. Desan, et al., "Attitude change after a curriculum on the science and philosophy of well-being and happiness for high school students: a classroom-randomized trial," *Br. J. Educ. Psychol.*, vol. 91, no. 4, pp. 1333-1348, 2021, doi: 10.1111/bjep.12419.

17. C. Chen, Y. Chen, X. Jia, S. Lei, C. Yang, Q. Nie, and B. Weiss, "Cultural adaptation and evaluation of a school-based positive psychology intervention among Chinese middle school students: A mixed methods program design study," *School Psychol.*, 2024, doi: 10.1037/spq0000661.
18. X. Juzhe, Y. Yang, Z. Zhihong, and P. Yanan, "Positive psychology applied among schools in China," *J. East China Normal Univ. Educ. Sci.*, vol. 37, no. 6, p. 149, 2019.
19. Y. Zhang, "Making students happy with wellbeing-oriented education: Case study of a secondary school in China," *Asia-Pac. Educ. Res.*, vol. 25, no. 3, pp. 463–471, 2016, doi: 10.1007/s40299-016-0275-4.
20. G. Jianping, S. Roslan, K. G. Soh, and Z. Zaremohzzabieh, "Effects of positive education intervention on growth mindset and resilience among boarding middle school adolescents in China: a randomized controlled trial," *Front. Psychol.*, vol. 15, p. 1446260, 2024, doi: 10.3389/fpsyg.2024.1446260.

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