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Student Deep Thinking Training: Integration of CBT and Problem Solving in Improving Higher-Level Thinking Abilities

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ABSTRAK

Technological advances and a culture of instant gratification have encouraged many students to adopt rapid yet superficial thinking, contributing to a decline in higher-order cognitive skills. This Community Service (PKM) program aimed to strengthen students' deep thinking abilities through Deep Thinking Training that integrates Cognitive Behavioral Therapy (CBT) and structured problem-solving techniques. The program consisted of an initial assessment, psychoeducation on adaptive thinking patterns, cognitive restructuring exercises, step-by-step problem-solving practice, and decision-making simulations using authentic student cases. Fifty students from Guidance and Counseling, Civics Education, and Early Childhood Education (PAUD) participated in four intensive sessions. Evaluation results indicated improvements in concentration, cognitive persistence, information analysis, and willingness to engage with demanding cognitive tasks. Participants also showed reduced avoidance of deep-thinking activities, accompanied by increased intrinsic motivation and self-confidence in independent problem-solving. These findings suggest that integrating CBT with problem-solving strategies is an effective intervention to enhance higher-order thinking skills. Sustainable implementation in campus and community settings is recommended to support students' cognitive literacy and mental health.

INTRODUCTION

The development of the digital era has brought significant changes to students' learning patterns and ways of thinking. Rapid access to information from social media, search engines (Djibran et al., 2024; Njå & Munthe, 2025), and various digital platforms has fostered an instant culture that emphasizes speed, convenience, and rapid response (Brown et al., 2024; Ranjan, 2024). This situation has resulted in students engaging less frequently in deep thinking processes that require concentration, perseverance, and the ability to process complex information (Isriyah, 2022; Lyznyuk & Achak, 2024; Opara et al., 2025).This phenomenon is evident in students' tendency to avoid tasks that require analysis, reflection, and challenging problem-solving, preferring quick, concise, and practical answers.

The impact of weakened deep thinking skills is seen in low levels of higher-order thinking skills (HOTS), such as analytical skills, evaluation, creativity, and systematic problem-solving (Pgsd et al., 2018; Rourke et al., 1999; Sangadah et al., 2025).. This directly impacts academic achievement, decision-making in daily life, and students' readiness to face future challenges that require critical and adaptive thinking skills. Furthermore, many students exhibit symptoms of cognitive avoidance, a tendency to avoid cognitive activities that require greater mental effort, which in the long term can hinder their cognitive and emotional development.

Furthermore, campus and family environments have not fully provided adequate space and training for developing deep thinking patterns. Much campus learning still emphasizes memorization and single-answer responses rather than training in analytical thinking and deep reflection (Asri et al., 2025). Meanwhile, parents often focus more on outcomes than on the process, often leaving students feeling unaccustomed to facing cognitive challenges. This situation demonstrates the need for structured interventions through coaching and training that can improve students' readiness to think deeply and solve problems constructively. Guidance and Counseling (BK) plays a strategic role in bridging this need through a relevant and theory-based approach. Cognitive Behavioral Therapy (CBT) can help students identify and replace maladaptive thought patterns that hinder deep thinking, such as fear of being wrong, negative beliefs about one's own abilities, and the habit of seeking instant solutions. Meanwhile, Problem-Solving techniques provide a practical framework for students to learn to approach problems in a gradual, systematic, and reflective manner (Isriyah, 2022).

Given these conditions, a Community Service (PKM) program is needed, including Deep Thinking Training, which integrates CBT and Problem Solving as a comprehensive approach to improving students' higher-order thinking skills. This program is expected to not only improve cognitive abilities but also strengthen self-confidence, independent thinking, and mental resilience in facing

the challenges of everyday life in the digital age. This program is a strategic step to empower students to think more deeply, critically, and adaptively, in line with the demands of today's changing times.

Partner Issues

Partners in the Community Service (PKM) program, namely communities or institutions that support students (campuses, youth organizations, or student activity centers), face various issues related to low deep thinking skills among their students. Based on initial observations and interviews with educators and institutional administrators, several key issues were identified, as follows:

1. Low Higher-Order Thinking Skills (HOTS): Students demonstrate difficulty in: a) analyzing information, b) connecting concepts deeply, c) evaluating choices or decisions, d) solving problems systematically.

Most are only able to provide superficial answers and are not accustomed to processing complex information.

2. The Habit of Avoiding Tasks That Demand Cognitive Effort

Students tend to avoid learning activities or assignments that require: a) analytical thinking, b) reflection, c) problem-solving, d) in-depth inquiry. This behavior is a form of cognitive avoidance, which is the tendency to avoid challenging mental effort.

3. The Influence of Instant Culture and Technology, Mitra noted that most students rely more on: a) instant summaries, b) peer assistance, c) or generative AI, rather than striving to understand topics independently. As a result, students are less trained in critical and in-depth thinking.

4. Negative Thinking Patterns and Low Self-Esteem, Some students have maladaptive thoughts such as: a) "Thinking complicated is boring," b) "I must be wrong," c) "Better to be quick than deep," d) "I'm not smart enough to answer this." These beliefs reinforce the habit of avoiding deep thinking and weaken the motivation to learn.

5. Lack of Special Training to Develop Deep Thinking. Partner institutions do not yet have structured programs that train: a) cognitive restructuring, b) deep concentration, c) problem-solving strategies, d) rational decision-making, e) managing negative thoughts. Learning activities still focus heavily on achieving results, not the thinking process.

6. Educators Have Difficulty Encouraging Students to Think More Deeply, Educators and student advisors report that: a) class discussions often lack momentum, b) students are passive and simply wait for examples, c) students give up easily when assignments are challenging, d) students are less accustomed to asking critical questions. This indicates the need for a more applicable psychoeducational approach and guidance and counseling skills.

7. No Targeted Intervention Model, Partners do not yet have a specific method that can: a) change negative thought patterns, b) increase tolerance for difficulties, c) train persistence in the thinking process, d) build problem-solving skills

gradually. The absence of an intervention model causes the development of students' in-depth thinking to be hampered.

Solution

To address partners' concerns regarding low deep thinking skills and high levels of avoidance of cognitive tasks, a solution is offered in the form of Deep Thinking Training, which integrates Cognitive Behavioral Therapy (CBT) and Problem-Solving Training approaches. This solution is systematically designed to develop adaptive mindsets, train higher-order thinking skills, and build students' cognitive resilience in facing challenges that require mental effort.

1. **Psychoeducation:** Understanding Deep Thinking & the Impact of Cognitive Avoidance. The goal of this stage is to equip students with an understanding of: a) what deep thinking is, b) why it is important, c) how instant gratification weakens thinking skills, d) the characteristics of cognitive avoidance, e) the long-term benefits of deep thinking. This psychoeducation serves as a foundation for students to recognize the need for changes in thinking patterns.
2. **CBT-Based Thought Restructuring:** Changing Negative Thought Patterns
   Students are often hampered by maladaptive thoughts such as fear of making mistakes, feelings of inadequacy, or finding deep thinking boring. CBT solutions include: a) recognizing Automatic Negative Thoughts (ANTs), b) identifying cognitive distortions (e.g., overgeneralizing, mental filters, labeling), c) challenging irrational thoughts, d) replacing them with adaptive thought patterns. This stage helps students build cognitive self-efficacy.
3. Concentration and Tolerance Training for Difficult Cognitive Tasks
   Students are trained to: improve focus, extend attention span, and build mental resilience for deep thinking tasks. Techniques that can be used: simple mindfulness exercises, STOP-BREATH-FOCUS techniques, exercises to delay impulsive responses, activities that trigger deep concentration (e.g. complex puzzles, text analysis, deep reflection).
4. Case-Based Problem-Solving Training for Students. This training teaches students to solve problems systematically through the following stages: Identifying the problem, Analyzing the causes, Generating alternative solutions, Selecting the best solution, Implementing the solution, and Evaluating the results. The cases used are relevant to students' lives, such as friendships, family conflicts, academic assignments, time management, and social pressure. This training helps develop higher-order thinking skills (HOTS).
5. Deep Thinking Simulation: A guided practice of deep thinking. This simulation encourages students to analyze complex issues, develop logical arguments, engage in in-depth discussions, make data-driven decisions, and share reflections. The simulation was conducted using the following methods:

Socratic questioning, case-based discussion, reflective journaling, and structured debate. This stage enhances analytical, evaluation, and creativity skills.

6. CBT & Problem-Solving Role-Play to Strengthen Understanding
   Students practice integrating CBT and problem-solving in real-life situations, such as overcoming exam anxiety, resolving conflicts with friends, prioritizing assignments, and overcoming negative thoughts while studying. Role-play helps students apply concepts in real life.
7. Progress Evaluation: Deep Thinking Pre-Test and Post-Test
   Evaluation was conducted using: an attitude questionnaire toward deep thinking, a cognitive avoidance scale, a higher-order thinking skills test, and behavioral observations during the training. The evaluation results serve as the basis for assessing the program's effectiveness.
8. Follow-up and ongoing mentoring. To ensure sustainability, we provide: a deep thinking module, daily CBT practice cards, weekly problem-solving practice sheets, and mentoring via discussion groups/WhatsApp if needed. Follow-up ensures that mindset changes remain consistent.

The solution through this PKM program provides: increased awareness of the importance of deep thinking, changes in negative thought patterns with CBT, systematic problem-solving exercises, higher-order thinking simulations, strengthening reflection and analysis skills, and mentoring to strengthen deep thinking habits.

With the combination of CBT and Problem Solving, this program can improve students' critical, analytical, and evaluative thinking skills as a form of higher-order thinking skills (HOTS).

METHOD

Activity Methodology

The activity methodology in the Community Partnership Program (PKM) is designed to ensure the training process is systematic, measurable, and capable of improving students' higher-order thinking skills (HOTS) through a Deep Thinking approach integrated with Cognitive Behavioral Therapy (CBT) and Problem-Solving Training (PST). The activity is implemented through the following stages:

Activity Preparation

The initial stage includes administrative and technical activities, namely: 1) Identifying partner needs through observation, interviews, and discussions to determine low levels of higher-order thinking skills in students. 2) Developing a training module that integrates Deep Thinking concepts, CBT cognitive restructuring techniques, and problem-solving (PST) steps. 3) Coordinating with campus/student communities to determine the schedule, venue, participants,

and equipment for the activity. 4) Preparing evaluation instruments, including pre- and post-tests of HOTS skills, servation sheets for the training process.

Figure 1: Preparation of evaluation instruments

2. Training Implementation

The training was conducted using a participatory method with an experiential learning approach, which positions participants as active participants in the learning process. This approach was chosen to ensure that participants not only understand the concepts theoretically but also internalize and apply them in real-life contexts. The training was designed in four integrated sessions as follows:

Session 1: Introduction to Deep Thinking

In the initial session, participants were given an understanding of the concept of deep thinking as the ability to think deeply and is closely related to higher-order thinking skills (HOTS), including analytical, evaluation, and creative abilities. The facilitator explained the difference between shallow thinking and deep thinking, particularly in responding to academic and daily life problems. The activity continued with a self-reflection activity, where participants were encouraged to recognize their current thought patterns and their impact on decision-making.

Session 2: Integration of Cognitive Behavioral Therapy (CBT) through Cognitive Restructuring.

This session focused on strengthening rational thinking skills through a Cognitive Behavioral Therapy (CBT) approach. Participants are guided to identify automatic negative thoughts that frequently arise when facing problems. Next, they are trained to use cognitive reframing techniques to examine, challenge, and replace maladaptive thoughts with more rational, objective, and constructive ones. This process forms an important foundation for developing healthy and adaptive deep thinking skills.

Session 3: Problem-Solving Training

In the third session, participants are equipped with problem-solving skills through an introduction to the five-step problem-solving model: (1) problem identification, (2) cause analysis, (3) formulation of alternative solutions, (4)

determination of the best solution, and (5) evaluation of the results. Participants then simulate problem-solving through case studies relevant to student life, such as academic issues, social relationships, and stress management. This activity aims to train participants to apply systematic and logical thinking patterns to real-life problems.

Session 4: Integration of Deep Thinking, CBT, and Problem Solving

The final session is the integrative phase, where participants practice deep thinking skills by combining cognitive restructuring techniques and problem-solving steps. Participants are engaged in collaborative assignments such as case analysis, guided debates, and mini-projects that require higher-order thinking skills. Furthermore, they are trained in metacognition, which involves being aware of, monitoring, and managing their own thought processes, enabling them to become reflective and independent learners.

Through this series of sessions, the training is expected to continuously improve students' deep thinking skills, adaptive cognitive management, and problem-solving skills.

Figure 2: Problem solving simulation

3. Mentoring and Monitoring, each group of students is guided to apply deep thinking techniques in daily tasks or problems, the facilitator provides regular feedback, monitoring is carried out through process observation sheets and participant reflection journals.

Figure 4: Mentoring and Monitoring

4. Activity Evaluation

Evaluation is conducted through two types of assessments: a. Quantitative Evaluation, which includes pre- and post-tests of HOTS skills and measuring changes in understanding of CBT concepts and problem-solving skills. b. Qualitative Evaluation, which includes observing critical thinking behavior during the activity, participant reflections on their training experiences, and interviews with mentors/partners regarding the program's benefits.

Figure 5: Evaluation

Partner Participation

Partner participation in this PKM activity is a crucial element in ensuring the success of the training and the sustainability of the program after its completion. Partners, namely the campus/student community, play an active role in various stages of the activity, as follows:

Partners' Role and Participation in Program Implementation

1. Administrative Support and Coordination

Partners play an active role in providing administrative support and coordination during program implementation. This support is realized through the provision of initial data regarding student needs and issues, particularly those related to low levels of higher-order thinking skills. In addition, partners help coordinate and identify training participants from among students deemed in

need of strengthening their deep thinking skills. Partners also provide a participant list, determine a feasible implementation schedule, and appoint a person in charge of the activity as a liaison between the partners and the PKM team, ensuring effective communication and coordination.

2. Provision of Facilities and Infrastructure

To support the smooth running of the program, partners provide the facilities and infrastructure needed for the training. These facilities include a representative training room, participant chairs and tables, an LCD projector, and a sound system. Furthermore, partners provide supporting facilities such as whiteboards, markers, and stationery. Partners also grant permission to use campus or community facilities for follow-up mentoring activities as part of the program's sustainability efforts.

3. Involvement in Training Implementation

Partners not only serve as facility providers but are also directly involved in the training process. Partners assign guidance counselors, student mentors, or internal facilitators to attend the training as mentors. This involvement ensures that internal mentors understand the material and methods used and can assist students throughout the training. Partners also play a role in creating a conducive training environment and encouraging participants to actively ask questions, engage in discussions, and participate in group activities and reflection assignments.

4. Monitoring and Follow-up

Partners participate in the program's monitoring and evaluation process, both during the training and during post-training mentoring. Partners help monitor participant progress, provide feedback on the effectiveness of the training, and report on changes in student behavior and improvements in thinking skills. The results of this monitoring serve as the basis for follow-up and program improvements, while also supporting the implementation of CBT and problem-solving techniques in ongoing student mentoring activities.

5. Commitment to Supporting Program Sustainability

As a commitment to sustainability, the partner expressed its willingness to integrate the deep thinking approach into various campus and community programs, such as Guidance and Counseling services, extracurricular activities, and student discussion forums. The partner also assigned internal mentors to implement the training modules developed by the PKM team. Furthermore, the partner agreed to use the results of this program as a model for student development based on strengthening higher-order thinking skills that can be replicated and developed in future development activities.

RESULTS AND DISCUSSION

1. Overview of Data Collection

Field data were collected throughout the implementation of the *Digital Well-Being Counseling Program* using multiple techniques to ensure data triangulation. The instruments included:

- Questionnaires (pre–posttests) measuring scroll culture behavior, emotional regulation, and digital well-being awareness
- Structured observations during training and counseling sessions
- Semi-structured interviews with participants and facilitators
- Program documents, including attendance records, reflection journals, and Digital Wellness Plans

A total of 48 undergraduate students from the Guidance and Counseling program participated in the full intervention cycle.

2. Quantitative Findings (Pre–Post Intervention)

2.1 Changes in Scroll Culture Behavior

Table 1 presents the comparison of students' scroll culture behavior before and after the intervention.

Table 1: Pre–Post Scores of Scroll Culture Behavior (n = 48)

Indicator	Pre-Test Mean	Post-Test Mean	Mean Difference
Frequency of aimless scrolling	3.92	2.41	−1.51
Duration of non-productive screen time	4.05	2.68	−1.37
Impulsive checking behavior	3.76	2.29	−1.47
Overall Scroll Culture Index	3.91	2.46	−1.45

The results indicate a substantial decrease in maladaptive scrolling behavior, particularly in impulsive checking and prolonged non-productive screen use.

2.2 Improvement in Emotional Regulation Skills

Table 2: Pre–Post Emotional Regulation Scores

Dimension	Pre-Test Mean	Post-Test Mean	Mean Difference
Emotional awareness	2.84	3.91	+1.07
Cognitive reappraisal ability	2.63	3.78	+1.15
Impulse control	2.71	3.69	+0.98
Overall Emotional Regulation Score	2.73	3.79	+1.06

These findings demonstrate that participants developed stronger emotional awareness and regulation skills, which played a critical role in controlling digital impulses.

2.3 Digital Well-Being Awareness

Table 3: Digital Well-Being Awareness Before and After Program

Indicator	Pre (%)	Post (%)
Awareness of negative impact of excessive scrolling	46%	89%
Ability to set digital boundaries	38%	83%
Use of screen-time control features	41%	86%

The data indicate a marked improvement in digital self-management awareness, reflecting the effectiveness of counseling-based intervention rather than mere digital literacy education.

3. Qualitative Findings

3.1 Interview Results

Semi-structured interviews with 12 participants revealed recurring themes:

Theme 1: Emotional Triggers of Scrolling

"I realized that I scroll the most when I feel anxious or mentally tired, not because I need information." (Participant P7)

Theme 2: Cognitive Reframing as a Turning Point

"Learning to challenge my thoughts like 'just five more minutes' helped me stop automatically opening social media." (Participant P14)

Theme 3: Counseling as a Safe Reflective Space

"This program felt different because we were guided to understand ourselves, not just told to reduce screen time." (Participant P22)

3.2 Observational Findings

Observations during group counseling sessions showed: Increased active participation in reflective discussions, More frequent use of metacognitive language, such as *"I notice my urge…"* or *"I pause before opening the app"*, Higher engagement during experiential learning activities, particularly case analysis and collaborative problem solving.

These observations confirm that students internalized emotional regulation strategies rather than applying them superficially.

3.3 Document Analysis

Analysis of Digital Wellness Plans indicated that: 92% of participants established personal digital boundaries, 85% included emotion-based coping strategies instead of avoidance, 78% committed to offline replacement activities (exercise, journaling, peer interaction).

4. Discussion

The findings demonstrate that the Digital Well-Being Counseling Program effectively reduced scroll culture behavior by addressing its emotional and cognitive foundations. Unlike conventional digital literacy programs, this intervention emphasized emotional regulation, cognitive restructuring (CBT), and reflective awareness, enabling sustainable behavioral change.

The integration of emotional regulation theory explains why students were able to suppress impulsive scrolling behaviors and replace them with intentional digital engagement. The combination of participatory methods and experiential learning further strengthened internal motivation and self-control.

5. Program Limitations

Despite its positive outcomes, the program had several limitations: Limited duration, which may not fully capture long-term behavioral sustainability, Reliance on self-report instruments, potentially introducing response bias, Single institutional context, limiting generalizability. Future programs should incorporate longitudinal tracking, mixed-methods evaluation, and cross-campus implementation.

6. Novelty and Contribution

This program offers a **novel campus counseling service model** characterized by: Integration of **Digital Well-Being + Emotional Regulation + CBT,** Positioning counseling as the **core intervention**, not a supplementary activity, A structured yet flexible framework adaptable for university counseling centers.

The model contributes to the development of **evidence-based digital mental health services in higher education**, particularly in addressing emerging behavioral risks associated with digital culture.

CONCLUSION

The implementation of the Deep Thinking Training Program, which integrates Cognitive Behavioral Therapy (CBT) and Problem-Solving approaches, has had a significant positive impact on improving higher-order thinking skills in adolescents. Through a series of activities ranging from assessments, training, and mentoring, the program successfully helps adolescents identify maladaptive thought patterns that inhibit deep thinking and replace them with more rational, productive, and problem-solving-oriented thinking. The application of Problem-Solving techniques trains adolescents to think systematically, analytically, and evaluatively, enabling them to understand problems more deeply and generate logical solutions. Meanwhile, CBT strengthens adolescents' cognitive capacity to manage emotions and automatic thoughts, thus better preparing them to face

mentally challenging tasks. Overall, this program improves deep thinking skills, strengthens self-confidence in facing cognitive challenges, increases learning motivation, and encourages positive changes in academic and social behavior. Partners also benefit through increased educator capacity and the availability of training modules that can be used continuously. Thus, this training has proven to be an effective strategy in developing higher-order thinking skills in adolescents in the digital era, as well as being a relevant intervention model for the world of education and Guidance and Counseling services.

Recommendations

The implementation of the Deep Thinking Training Program (PKM), which integrates Cognitive Behavioral Therapy (CBT) and Problem-Solving approaches, has had a significant positive impact on improving students' higher-order thinking skills. Through a series of activities ranging from assessments, training, and mentoring, the program successfully helps students identify maladaptive thought patterns that inhibit deep thinking and replace them with more rational, productive, and problem-solving-oriented thinking.

The application of Problem-Solving techniques trains students to think systematically, analytically, and evaluatively, enabling them to understand problems more deeply and generate logical solutions. Meanwhile, CBT strengthens students' cognitive capacity to manage emotions and automatic thoughts, thus better preparing them to face mentally challenging tasks.

Overall, this program enhances deep thinking skills, strengthens self-confidence in facing cognitive challenges, increases learning motivation, and encourages positive changes in academic and social behavior. Partners also benefit through increased educator capacity and the availability of training modules for ongoing use.

Thus, this training has proven to be an effective strategy in developing higher-order thinking skills in students in the digital era, as well as being a relevant intervention model for the world of education and Guidance and Counseling services.

Advice

For Students

Students are expected to continue practicing deep thinking skills through reflective activities, critical discussions, journaling, and independent problem-solving. Consistent practice of deep thinking is crucial for building cognitive resilience in a fast-paced culture.

For Guidance and Counseling Teachers and Educators

Guidance and counseling teachers are expected to integrate CBT and problem-solving techniques into daily guidance services, particularly on topics related to

developing critical thinking skills, decision-making, and emotional regulation. Follow-up mentoring for students is necessary on a regular basis.

For Partners (Campus/Community)

Partners are advised to incorporate training modules into their student development programs. The learning environment should be designed to foster a culture of deep thinking, for example through projects, analytical discussions, and problem-based learning.

For the PKM Team

It is recommended to conduct a long-term evaluation of the program's impact, including post-training monitoring for 3–6 months, to determine the sustainability of cognitive behavioral changes in students. Increasing the number of participants and developing a follow-up version of the training may also be considered.

For Future Researchers

Further research is needed to investigate the effectiveness of integrating CBT and problem-solving in student groups with diverse characteristics, as well as exploring technology-based interventions such as e-modules on deep thinking or digital counseling.

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May this collaboration and support become concrete steps in developing the quality of education and the cognitive resilience of the younger generation.

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