



# Content validity of reflective mental training cards for student-athletes: a content validation study

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**Abstract:** Structured media for reflective mental training among student-athletes remain limited, despite the growing importance of psychological skill development in sports. Reflective Mental Training Cards were developed to facilitate athletes' self-reflection through symbolic illustrations, psychological keywords, and guided reflective questions. This study aimed to evaluate the content validity of the Reflective Mental Training Cards developed for student-athletes through expert judgment using Aiken's V coefficient. A content validation study was conducted involving three experts in sport psychology and educational media. The experts evaluated the cards using a structured validation instrument covering content relevance, reflective questions, psychological keywords, visual illustrations, and practical usability. Content validity was analyzed using Aiken's V coefficient. Content validity was analyzed using Aiken's V coefficient. The Aiken's V coefficients ranged from 0.81 to 0.95, indicating high to very high content validity across all evaluated aspects. The highest coefficient was obtained for content relevance ( $V = 0.95$ ), while practical usability showed the lowest but still acceptable coefficient ( $V = 0.81$ ). The Reflective Mental Training Cards demonstrated high content validity and are considered suitable as a reflective mental training medium for student-athletes. Further studies are recommended to examine their effectiveness in improving athletes' psychological skills through experimental research.

**Keywords:** Aiken's V; content validity; reflective learning; sport psychology; psychological skills

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## **INTRODUCTION**

Mental factors play a crucial role in determining athletes' performance and competitive consistency (S. P. Putra et al., 2025). In addition to physical preparation and technical skills, psychological readiness such as emotional regulation, confidence, focus, and achievement motivation significantly influences athletic performance. Gandrapu & Rakesh, (2024) told that these mental attributes are often associated with mental toughness, which refers to the ability of athletes to maintain optimal performance under pressure, adversity, and competitive demands. Previous studies have emphasized that athletes with strong psychological skills tend to demonstrate greater resilience, motivation, and performance stability during training and competition.

Despite the recognized importance of mental preparation in sports, the implementation of mental training programs among university athletes is often still limited. In many cases, mental training is conducted informally through verbal motivation or short discussions between coaches and athletes, without the support of structured training media (Widya Putri et al., 2025). As a result, athletes may find it difficult to engage in systematic self-reflection or to develop consistent psychological skills that support their performance. The absence of practical and engaging mental training tools highlights the need for innovative media that can facilitate reflective learning and psychological development among student-athletes (Golby & Wood, 2016).

One promising approach in psychological skill development is the use of reflective learning strategies. Reflective activities encourage individuals to examine their thoughts, emotions, and experiences in order to develop greater self-awareness and adaptive coping strategies. Previous studies consistently indicate that reflective training contributes to athletes' psychological development by enhancing emotional awareness, self-regulation, and confidence Roy et al., (2021). These benefits can be further strengthened when reflective activities are supported by visual stimuli that facilitate deeper cognitive engagement (Hughes et al., 2009). Consequently, reflective card-based media have emerged as a promising approach for structuring reflective practice in sports settings (Sutoro et al., 2023). Collectively, these findings suggest that integrating visual representations with guided reflection may provide a practical strategy for supporting athletes' psychological skill development.

Although previous studies have demonstrated the benefits of reflective training and psychological skills development in sport, most research has focused on intervention effectiveness or psychological outcomes rather than the development and validation of structured reflective media. Empirical evidence regarding the content validity of reflective card-based media specifically designed for student-athletes remains limited. Consequently, there is insufficient evidence to ensure that such media adequately represent the intended psychological constructs before being implemented in mental training programs. This gap highlights the need for systematic content validation as an essential step in developing evidence-based mental training media.

The development of educational and psychological training media requires systematic validation to ensure that every component accurately represents the intended theoretical constructs (Kania et al., 2024). Content validity is particularly important for reflective media because the effectiveness of reflective activities depends not only on attractive visual design but also on the conceptual relevance of the reflective prompts, psychological themes, and instructional clarity. Therefore, expert judgment serves as an essential step in establishing the theoretical appropriateness of the developed media before further implementation.

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Overall, previous studies have established the importance of reflective practice and psychological skills training in sports. They also suggest that visual learning media can enhance engagement and support reflective processes. However, these findings primarily emphasize intervention outcomes, whereas limited attention has been given to the systematic development and validation of reflective media specifically designed for student-athletes. Consequently, empirical evidence regarding the conceptual quality of such media remains scarce.

The novelty of this study lies in the development and content validation of Reflective Mental Training Cards that integrate symbolic visual images, psychological keywords, and

guided reflective questions into a single structured medium for student-athletes. Unlike conventional mental training approaches that primarily rely on verbal discussion or written reflection, the proposed cards provide a practical and evidence-based reflective tool grounded in sport psychology principles and systematically evaluated through expert judgment using Aiken's *V* coefficient.

Content validation constitutes a fundamental stage in educational media development because it ensures that every component of the product accurately represents the intended theoretical constructs before wider implementation. For reflective mental training media, expert validation is particularly important to evaluate the appropriateness of psychological concepts, clarity of reflective prompts, suitability of symbolic illustrations, and overall usability. Without adequate content validation, the effectiveness of the developed media cannot be meaningfully interpreted in subsequent intervention studies.

Therefore, this study aimed to examine the content validity of the Reflective Mental Training Cards by evaluating the relevance, clarity, and appropriateness of their components through expert judgment using Aiken's *V* coefficient before further effectiveness testing. Expert evaluation was conducted to assess the relevance, clarity, and suitability of the card content for use in mental training contexts among university athletes. The findings of this study are expected to provide empirical evidence regarding the validity of the developed training media and contribute to the development of innovative mental training tools in sport psychology.

This study is expected to contribute both theoretically and practically to the field of sport psychology. Theoretically, it extends the literature on the development and validation of evidence-based mental training media by providing empirical evidence of the content validity of Reflective Mental Training Cards. Practically, the validated cards may serve as a structured reflective tool for coaches, sport psychologists, and educators to facilitate psychological skill development among student-athletes. Furthermore, this study establishes an important foundation for subsequent research examining the effectiveness of the cards through experimental or quasi-experimental designs.

## **MATERIAL AND METHODS**

### **Participants**

The participants in this study consisted of 15 student-athletes from Universitas PGRI Adi Buana Surabaya, Indonesia, who were selected using a purposive sampling technique. The

participants were aged between 18 and 23 years and comprised 10 male and 5 female student-athletes. They represented several university sports clubs, including sepak takraw and martial arts, and had experience competing at university and regional levels. All participants were actively involved in regular training programs conducted at least twice per week.

The inclusion criteria were: (1) being an active university student-athlete, (2) participating regularly in organized sports training, (3) having competitive experience at the university or regional level within the previous year, and (4) providing voluntary informed consent to participate in the study. Participants were excluded if they had an injury that limited their participation, had previously received structured reflective mental training using similar media, or did not complete all evaluation procedures. Before data collection, all participants were informed about the objectives, procedures, and voluntary nature of the study. Written informed consent was obtained from all participants prior to their involvement in the research.

The participants were selected using purposive sampling because the study aimed to obtain feedback from individuals who closely represented the intended users of the Reflective Mental Training Cards. Active student-athletes who regularly participated in structured sports training and competitions were considered the most appropriate participants, as they routinely encounter psychological demands such as competitive pressure, emotional regulation, confidence, and performance challenges. Their experiences enabled them to provide meaningful evaluations regarding the clarity, relevance, and practical usability of the developed cards during the preliminary user evaluation stage. Therefore, purposive sampling was considered appropriate to ensure that the feedback reflected the perspectives of the target user population rather than those of the general student population.

#### Prosedure

This study consisted of two stages: expert content validation and preliminary user evaluation. During the first stage, the Reflective Mental Training Cards were evaluated by three experts in sport psychology and educational media. The experts assessed the relevance, clarity, appropriateness, and representativeness of each card component using a structured validation instrument. The expert ratings were analyzed using Aiken's V coefficient to determine the content validity of the developed media.

Following the expert validation process and subsequent revisions, the validated cards were introduced to 15 student-athletes for a preliminary user evaluation. At this stage, the participants used the cards during guided reflective activities and provided feedback regarding

their clarity, usability, and practicality. The student-athletes were not involved in determining the content validity but served as end users to evaluate the practicality of the developed media.

Content validation was conducted by three expert validators selected through purposive criteria. The panel consisted of one expert in sport psychology and two experts in educational media and instructional design. Each validator held a doctoral or master's degree in a relevant discipline and had more than five years of experience in teaching, research, or professional practice related to sport psychology, educational media development, or athlete training. Their expertise ensured that the evaluation covered both the psychological content and the instructional quality of the Reflective Mental Training Cards.

The Reflective Mental Training Cards were designed based on concepts from sport psychology, particularly mental toughness, emotional regulation, confidence, and achievement motivation. Each card consists of three main components: (1) symbolic visual illustrations intended to stimulate reflective thinking, (2) key psychological keywords representing mental strength attributes, and (3) reflective guiding questions that encourage athletes to explore their thoughts, emotions, and experiences related to training and competition.

The expert validation instrument was developed based on established principles of educational media evaluation and sport psychology literature. The assessment indicators were adapted from previous studies on instructional media validation and content validity, covering five dimensions: (1) content relevance, (2) clarity of reflective questions, (3) appropriateness of psychological keywords, (4) suitability of visual illustrations, and (5) practical usability. Each item was rated using a five-point Likert scale ranging from 1 (not relevant) to 5 (highly relevant). The instrument was reviewed prior to implementation to ensure clarity and consistency across all evaluation items.

During the implementation phase, the student-athletes participated in a guided reflective session using the card set. In this session, participants selected cards and responded to the reflective questions provided on each card. The process was facilitated by the researcher to ensure that the athletes understood how to interpret the visual symbols and respond to the reflective prompts.

Following the session, participants were asked to complete a user evaluation questionnaire assessing several aspects of the cards, including ease of use, visual attractiveness, and perceived usefulness for mental training (Wu et al., 2023). Observations and short

reflective discussions were also conducted to gather additional qualitative feedback regarding the athletes' experiences when using the cards.

#### Statistical Analysis

The quantitative data obtained from the expert validation forms were analyzed using Aiken's *V* coefficient (Aiken, 1985) to determine the degree of content validity of each item and each assessment dimension. Aiken's *V* was selected because it is widely recommended for evaluating the relevance of instrument or media content based on expert judgment.

The coefficient was calculated using the following formula:  $V = \frac{\sum s}{n(c-1)}$

where *s* is the adjusted rating score assigned by each expert ( $r - lo$ ), *r* is the score assigned by the expert, *lo* is the lowest score on the rating scale, *n* is the number of expert validators, and *c* is the number of response categories. The coefficient ranges from 0 to 1, with higher values indicating stronger agreement among experts regarding the relevance of the evaluated content.

The Aiken's *V* coefficients were calculated using Microsoft Excel based on the original formula proposed by Aiken (1985). Following commonly accepted recommendations, coefficients of 0.80 or higher were interpreted as indicating high content validity, whereas values below 0.80 indicated that the corresponding component required revision before implementation.

In addition to the quantitative analysis, qualitative comments and suggestions provided by the expert validators were analyzed descriptively and used as the basis for revising the Reflective Mental Training Cards. During the preliminary user evaluation, responses from the student-athletes were summarized using descriptive statistics to describe the perceived clarity, usability, and practicality of the developed media.

#### Ethics Committee

This study followed ethical guidelines for research involving human participants. All participants were informed about the objectives, procedures, and voluntary nature of the study before participation. Informed consent was obtained from all student-athletes, and their responses were treated confidentially and used solely for research purposes.

The research procedures were conducted in accordance with the ethical standards of academic research at Universitas PGRI Adi Buana Surabaya.

## RESULTS

The content validity of the Reflective Mental Training Cards was evaluated by three expert validators with expertise in sport psychology and educational media. The evaluation focused on five dimensions: content relevance, clarity of reflective questions, appropriateness of psychological keywords, suitability of visual illustrations, and practical usability. The experts assessed each item using a five-point Likert scale, and the ratings were analyzed using Aiken's V coefficient.

The results demonstrated that all evaluation dimensions achieved high levels of content validity. The Aiken's V coefficients ranged from 0.81 to 0.95, indicating substantial agreement among the expert validators regarding the appropriateness of the developed media.

The detailed results of the content validity analysis are presented in Table 1.

**Table 1.** Content Validity Results of Reflective Mental Training Cards

No	Evaluation Aspect	Aiken's V	Validity Level
1	Content relevance to sport psychology concepts	0.95	Very high
2	Clarity of reflective questions	0.92	Very high
3	Appropriateness of psychological keywords	0.90	Very high
4	Suitability of visual illustrations	0.88	High
5	Practical usability for student-athletes	0.81	High

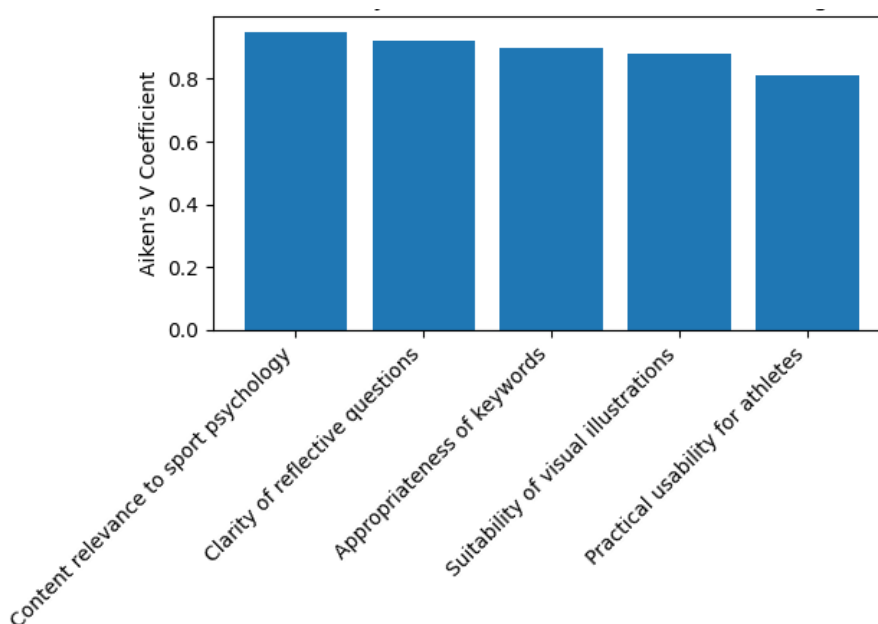
Among the evaluated dimensions, content relevance obtained the highest coefficient ( $V = 0.95$ ), indicating excellent agreement that the card contents appropriately represented the intended psychological constructs. Conversely, practical usability received the lowest coefficient ( $V = 0.81$ ); however, this value remained above the predetermined acceptance criterion ( $V \geq 0.80$ ), indicating that the media were considered suitable for implementation following minor revisions.

The clarity of reflective questions also obtained a very high validity coefficient ( $V = 0.92$ ). This suggests that the reflective prompts included in the cards were considered clear, understandable, and capable of encouraging athletes to engage in meaningful self-reflection during mental training sessions.

Similarly, the appropriateness of psychological keywords achieved a validity value of 0.90, indicating that the keywords used in the cards effectively represent psychological attributes relevant to athletic mental development.

Meanwhile, the visual illustration component obtained a coefficient of 0.88, which falls within the high validity category. This finding suggests that the symbolic images used in the cards were considered appropriate and supportive in facilitating reflective interpretation among student-athletes.

The practical usability aspect achieved a coefficient value of 0.81, which is still categorized as high validity. This indicates that the Reflective Mental Training Cards are considered practical and feasible for implementation in mental training sessions involving student-athletes.



**Figure 1.** Content Validity of Reflective Mental Training Cards

The results presented in Figure 1 further confirm that the Reflective Mental Training Cards meet the criteria for acceptable content validity. All evaluated aspects exceeded the minimum validity threshold ( $V \geq 0.80$ ), indicating that the developed cards are theoretically relevant and appropriate for supporting reflective mental training among student-athletes.

Besides providing quantitative ratings, the expert validators also offered qualitative feedback to improve the quality of the Reflective Mental Training Cards. The suggestions primarily concerned the clarity of reflective questions, the selection of psychological terminology, the consistency of symbolic illustrations, and the overall visual layout.

The research team carefully reviewed all comments and incorporated the relevant suggestions into the revised version of the cards prior to the preliminary user evaluation.

**Tabel 2.** Summary of Expert Suggestions and Product Revisions

Aspect	Expert Suggestion	Revision Implemented
Reflective questions	Simplify several questions to improve readability	Questions were rewritten using simpler and more concise language
Psychological keywords	Improve consistency of terminology	Keywords were standardized according to sport psychology terminology
Visual illustrations	Increase the relevance of several illustrations	Illustrations were revised to better represent psychological concepts
Layout	Improve font size and spacing	Layout and typography were adjusted to enhance readability

Following expert validation and product revision, the Reflective Mental Training Cards were introduced to 15 student-athletes (10 males and 5 females) to obtain preliminary feedback regarding their usability and practicality.

The participants reported that the cards were easy to understand and supported self-reflection during mental training activities. They particularly appreciated the combination of symbolic illustrations, psychological keywords, and guided reflective questions, which facilitated deeper reflection on their emotional experiences during training and competition.

Overall, the preliminary user evaluation indicated positive responses toward the developed media. The student-athletes perceived the Reflective Mental Training Cards as clear, relevant, and practical for supporting reflective mental training activities. No major usability issues were identified during this stage, although several participants suggested adding additional card themes to represent a wider range of psychological situations encountered in competitive sports.

## **Discussion**

The present study aimed to examine the content validity of the Reflective Mental Training Cards designed for student-athletes. The results indicate that all evaluated aspects achieved high to very high levels of validity, with Aiken's V coefficients ranging from 0.81 to 0.95. These findings suggest that the components embedded in the Reflective Mental Training Cards are

conceptually appropriate and relevant to support psychological training among student-athletes.

One of the most notable findings of this study is the high validity score for the content relevance to sport psychology concepts ( $V = 0.95$ ). This result indicates that the theoretical foundation of the cards is strongly aligned with key constructs in sport psychology, such as emotional regulation, confidence, motivation, and mental toughness. Psychological readiness has long been recognized as a crucial factor influencing athletic performance (Prasetiyo et al., 2022). Athletes who possess strong psychological skills tend to demonstrate better resilience, concentration, and emotional control during competition (Vitali et al., 2015). Therefore, integrating sport psychology principles into mental training tools is essential for supporting athletes in maintaining optimal performance under pressure.

Another important finding relates to the clarity of reflective questions, which also achieved a very high validity score ( $V = 0.92$ ). Reflective questioning plays a critical role in facilitating self-awareness and psychological skill development. Through reflective prompts, athletes are encouraged to examine their internal experiences, including emotions, thoughts, and reactions to training or competitive situations. Roy et al., (2021) reflective practices have been widely acknowledged as effective strategies for enhancing psychological learning and self-regulation. In the context of sports, reflective exercises can help athletes better understand their mental states and develop constructive coping strategies when facing competitive stress.

The appropriateness of psychological keywords included in the cards also demonstrated very high validity ( $V = 0.90$ ). Keywords such as confidence, focus, perseverance, and motivation represent important psychological attributes that contribute to mental toughness in athletes. The inclusion of these keywords helps guide athletes toward specific psychological themes during reflective activities. By focusing on these key constructs, the cards function not only as a reflective medium but also as a structured mental training tool that directs athletes' attention to important psychological aspects of performance (Rose & Burton, 2024).

The results also showed that the visual illustration component achieved a high validity score ( $V = 0.88$ ). Visual elements are an important aspect of reflective learning media, as symbolic images can stimulate cognitive and emotional responses that facilitate deeper reflection. Visual stimuli often encourage individuals to interpret meaning based on their personal experiences, which can lead to richer reflective discussions. M. F. P. Putra et al., (2025)

in psychological training contexts, the use of symbolic images can help athletes express thoughts and emotions that may otherwise be difficult to articulate verbally.

Although the practical usability aspect obtained the lowest coefficient among the evaluated components ( $V = 0.81$ ), the value still falls within the high validity category. This finding indicates that the Reflective Mental Training Cards are considered feasible and practical for use in mental training sessions involving student-athletes. The relatively lower score may reflect the fact that reflective training methods are still relatively unfamiliar for some athletes, particularly those who are more accustomed to physical training routines. Nevertheless, with proper guidance from coaches or sport psychologists, reflective training approaches can become valuable tools for enhancing athletes' psychological readiness (Kusuma Sari, 2021).

The findings of this study support previous research emphasizing the importance of structured mental training programs in sports. Psychological skill development, including emotional regulation, confidence building, and goal-oriented thinking, has been widely associated with improved athletic performance and competitive resilience. Media-based training tools, such as reflective cards, can provide a more engaging and structured approach to mental training compared to traditional verbal instruction alone (Safitri et al., 2023).

Nascimento & Dos Santos, (2025) furthermore, the use of reflective card-based media offers several practical advantages in sports training environments. First, the cards provide a simple and interactive method for initiating reflective discussions between athletes and coaches. Second, the visual and narrative elements of the cards encourage athletes to actively participate in mental training sessions. Third, the cards can be easily integrated into regular training programs without requiring complex technological resources.

Overall, the results of this study indicate that the Reflective Mental Training Cards possess strong conceptual validity and have the potential to serve as an innovative media tool for supporting psychological skill development in student-athletes (Isfahani, 2022). The integration of visual stimuli, psychological keywords, and reflective prompts provides a structured framework that can facilitate deeper self-awareness and mental preparation among athletes (Darisman et al., 2025).

However, several limitations should be acknowledged. The present study focused primarily on the content validation stage of the media development process, and the number of participants involved in the preliminary implementation was relatively limited (Rintaugu et al., 2022). Future research should involve larger samples of athletes and apply experimental or

quasi-experimental designs to further examine the effectiveness of the Reflective Mental Training Cards in improving psychological skills and athletic performance (Pujianto et al., 2022). In addition, further studies could explore the adaptation of the cards for different sports contexts or integrate digital platforms to enhance accessibility and engagement.

## CONCLUSION

This study aimed to examine the content validity of the Reflective Mental Training Cards developed for student-athletes. The results of the analysis using Aiken's V coefficient showed that all evaluated aspects achieved high to very high levels of validity, with coefficient values ranging from 0.81 to 0.95. These findings indicate that the components of the cards—including the relevance of sport psychology concepts, clarity of reflective questions, appropriateness of psychological keywords, suitability of visual illustrations, and practical usability—are conceptually appropriate and suitable for use in mental training contexts. The results suggest that the Reflective Mental Training Cards have strong potential as an innovative medium to support psychological skill development among student-athletes. By integrating symbolic visual elements, key psychological themes, and reflective prompts, the cards provide a structured approach to facilitating athletes' self-awareness, emotional regulation, and mental preparation.

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**Conflicts of Interest:** The authors declare no conflict of interest.

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