

Research on Cultivating Students' Decision-Making Ability in Campus Football Matches

Bingfeng Huang*

Guangzhou Communications Technician Institute, Guangzhou, 511370, China

*Corresponding author: 55187187@qq.com

Abstract: *With the high-quality development of campus football, young players need to have good decision-making skills in games to increase their competitiveness and improve the quality of the game. At present, campus football training mainly focuses on technical and physical skills and has neglected cognitive decision-making; thus, it cannot meet the demands of actual games. Based on the theory of information processing and the characteristics of campus football competitions, this paper studies the concept, cognitive process and obstacles of decision-making ability; it establishes a six-level pyramid ability structure for this skill and develops a three-in-one training system that comprises variable-situation training, limited-information fast-decision training and multi-objective conflict optimisation training. This paper will provide some suggestions to help grassroots coaches improve their training plans and focus on quality over quantity in campus football.*

Keywords: *Campus football, young players, decision-making ability, information processing theory, time pressure, cognitive training, tactical awareness*

Introduction

Campus football is a typical representative of the development of youth sports and the training of reserve football talents in China, and it is now moving towards a period of standardised, scientific and effective development. Football is a sport that combines cognition and motor skills, takes place in an open and changing environment, and all the technical activities performed by players require rapid information processing and continuous decision-making; the ability to make decisions is an advanced cognitive function that determines the outcome of a game. At present, the focus of campus football training is on fixed techniques, regular routines and traditional physical fitness; there are no training scenarios based on actual games. Grassroots coaches do not know much about decision-making and often attribute their mistakes in judgment to external circumstances. As the cognitive ability of young players has not been fully developed, they often have problems in their play, such as limited observation, slow reaction time, poor decision-making under pressure and frequent errors; therefore, their improvement in competition has been limited. According to the theory of information processing, this paper will examine the reasons and factors affecting people's decision-making ability, design a training plan in line with the actual conditions of campus football, and provide support for the scientific reform of training.

1. Core Connotation and Cognitive Operation Mechanism of Decision-Making Ability in Campus Football Matches

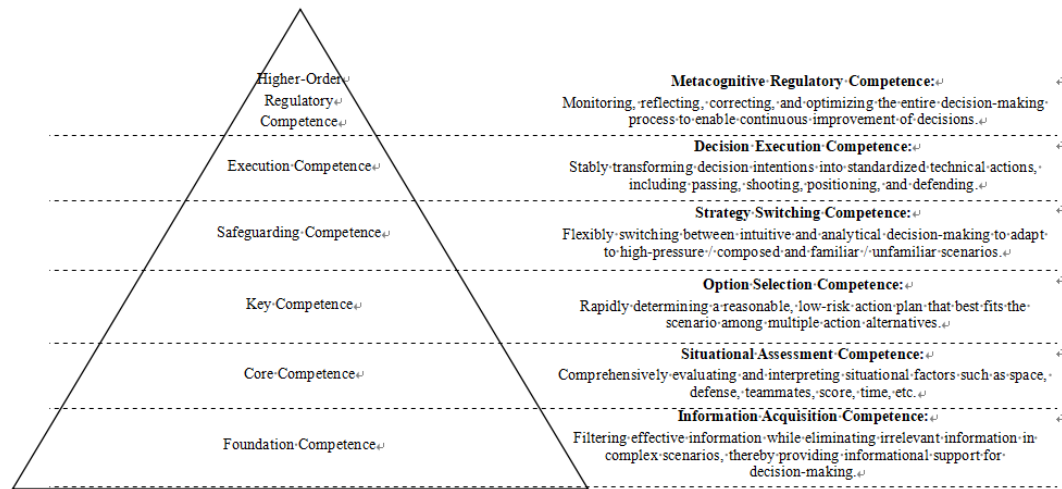
1.1 Core Connotation and Ability Structure of Decision-Making Ability

Campus football decision-making ability refers to the entire cognitive and behavioural capacity of student players to quickly obtain information, assess the situation, generate countermeasures, select a good option, implement it, and adjust based on changes in the game environment, such as frequent shifts in play, time pressure, lack of information, etc. Most of the campus football matches are small-field five-a-side and seven-a-side games; they have a small field, fewer players, fast changes in attack and defence, dense confrontations, a short decision-making period, and rich information. Therefore, the decisions need to be made promptly, locally, flexibly and stably.

In terms of the structure of the decision-making ability, the six sub-dimensions that constitute the student player's decision-making ability are information acquisition ability, situational assessment ability, option selection ability, strategy switching ability, decision execution ability and metacognitive

regulation ability (see Figure 1).

Figure 1: Six-Layer Pyramid Model of Students' Decision-Making Competence in Campus Football



The foundation is the ability to obtain information; that is, how easily one can acquire relevant knowledge in a chaotic world and ignore the noise. The core is the ability to judge in a given situation, which includes general knowledge of relevant factors in that environment, such as space, strength of the opponent, position of teammates, game time, current score, etc. The key is the option selection ability, that is, one's ability to choose a good or bad plan quickly from many choices; the safeguard is strategy switching ability, referring to one's capacity to switch between instinctive responses and rational thought, and to change the mode of decision-making according to circumstances. The implementation link is the decision-execution ability; that is to say, how well one can carry out a chosen plan in the form of specific skills. At the top is the metacognitive regulation ability, which is one's awareness of the process of learning and decision-making; it includes monitoring, self-reflection, correction and optimisation. The six abilities mentioned above work together at different levels and are coordinated to form a whole closed-loop system for decision-making; each one is necessary, and together they determine how well a player can make choices in the game situation.

1.2 Cognitive Mechanism of Match Information Extraction and Screening

There are many sources of information for a football match, it changes constantly, has redundant information and distracting elements. The first step in decision-making is to obtain relevant information and filter it reasonably. At the same time, one needs to control the position of the ball, the movement of players, their spatial distribution, rules of the game and scores. Processing speed is influenced by the kind of visual search, how attention is spread, working memory capacity and tactical patterns in long-term memory. Players with poorer decision-making skills are more likely to have only a single line of sight, focus too much on the ball or the nearest defender, have a narrow field of vision, and thus miss important information. Top-tier players can be more aware of the field before receiving the ball, focus on important areas when they have the ball, be mindful of the general situation off the ball, and thus distribute their attention more reasonably among the ball, players and space.

Because of the small size of working memory, one needs to filter out irrelevant information; thus, tactical templates in long-term memory can reduce the amount in working memory. The circumstances of campus football are relatively uniform, and traditional training has not been applied systematically to them; therefore, the students lack pattern reserves and are slow to react in decision-making.

1.3 The Effect of Time Pressure and Decision Adaptation in Dynamic Confrontation

One reason for poor judgment is lack of time. Most of the decision-making windows in campus football are only 1-2 seconds long. The effect of time pressure on the accuracy of decisions is not gradual; that is to say, for each increase in pressure, the accuracy will drop by about 15-20 per cent. A medium pressure should be used to pass the ball well; otherwise, it will be too difficult for people mentally and they will make more mistakes. The middle of the field is where most of the information and errors occur; wingers are less exposed, and under the pressure of defence-counterattacks, time is short. Under pressure,

the young players will have to decide quickly, and due to their inexperience, they may make a wrong choice.

1.4 Modification and Selection of Decision-Making Strategies

Due to the unevenness of the football field, players need to be able to switch between intuition and analysis flexibly. Intuitive decision-making is quick and easy; therefore, it is suitable for high-pressure situations and familiar circumstances, but it is not very accurate and takes more time, so it is not suitable for unfamiliar circumstances when time is limited. In short, the main kind of strategic error that student players make can be summarised as "over-analysis under pressure, failure to process in a short time, and inertia in decision-making". Cognitive flexibility and metacognition are required to change one's attitude reasonably.

2. Multidimensional Constraining Factors for the Development of Student Decision-Making Ability in Campus Football

The formation and development of the decision-making ability of students in campus football are the results of the combined effect of individual intrinsic cognitive factors, tactical literacy, external situational factors and training factors, and they do not arise naturally through game experience alone. Given the actual circumstances of campus football and the features of adolescent cognitive development, the development of students' decision-making ability is mainly limited by three factors: their level of tactical awareness, the complexity of the competition situation, and how often and in what form they receive feedback. The three factors are related, and together they will affect the speed of development and the upper limit of decision-making power.

2.1 Level of Tactical Awareness: Endogenous Basic Limitation

Tactical awareness is a player's general knowledge and foresight of the rules of a game, spatial and temporal relations, offensive and defensive ideas, tactical goals, etc.; it is the inner spirit of decision-making. At present, the tactical consciousness of student players generally has the characteristics of superficiality, fragmentation and passivity. First of all, they do not know when they have left the game and thus cannot respond in time. Second, they have a weak sense of spatio-temporal anticipation and are not good at creating and using space. Third, their positions and changes in offence and defence are not good, and there is a lack of coordination at the team level. Fourth, some players have good ideas but cannot implement them properly; due to their lack of technical stability, these decisions cannot be carried out. It is because the training process emphasises the completion of actions over thinking and judgement, and values the achievement of results more than the process. Coaches rarely explain the rules of the game, how to use space, why one attacks or defends, etc., in an organised way, and students do not learn about or recognise these things systematically. Therefore, the tactical knowledge will not be well-retained in long-term memory.

2.2 Complexity of Competition Scenarios: External Situational Constraint

The complexity of the competition scenario is composed of many factors, such as the number of information dimensions, the number of action options, the intensity of time pressure, the degree of confrontation interference, and the frequency of situational changes; it is one of the main external factors that affect decision accuracy and stability.

The Relationship between the Complexity of the Scenario and Decision Accuracy is an inverted U-shape. In simple cases, the information is relatively clear, there is only one option, and no external pressure; thus, the decision accuracy is relatively high, but such circumstances do not help to enhance people's decision-making ability. In the medium-complexity case, there is a moderate amount of information and a limited number of choices; therefore, students can process it efficiently within the limits of their cognitive load and make good decisions. In serious cases, there may be too much information, high stress, rapid changes, etc.; it is too much for students to process, and thus their decision-making accuracy will be significantly reduced.

2.3 Frequency and Form of Feedback: A Moderator

Feedback is used to meet the demands of external tactics and decision rules by changing the form of

students' internal judgment norms and behaviour habits. The stages of scientific feedback are as follows: The first is to provide prompt and regular feedback to help learners learn the basic rules; the second is to give some delayed feedback that can motivate independent thinking and deeper study.

At present, the three main problems with training feedback are as follows: First, there is only one type, and it focuses on whether the result is correct rather than on how to think. Second, the frequencies are not uniform; there are also cases of no feedback and excessive feedback. Thirdly, there is attribution bias; that is to say, the causes of errors are judged to be external or superficial, such as poor skills or inattention, and the underlying cognitive factors in information processing and strategy selection are ignored. The advantages of campus football, such as the fast speed of the game, quick changes and rich feedback, are not used to improve students' decision-making skills because the design of the feedback is too simple.

3. Systematic Training Design for Fostering Student Decision-Making Ability in Campus Football

Based on the cognitive operation mechanism and all other constraints of the decision-making ability of campus football students, in accordance with the laws of adolescent cognitive development, the formation laws of football skills and the orientation for practical match transfer, this paper will build a three-in-one modular system of "variable situation decision-making training, limited-information fast decision-making training and multi-objective conflict decision optimisation training" (see Table 1 below), in line with the progressive logic of easy-to-difficult, simple-to-complex, static-to-dynamic, single-to-compound and training-to-match application. The stages of the system are progressively more elaborate, and they are suitable for the actual circumstances of campus football.

Training Module	Core Objective	Design Logic	Training Principle	Main Practice Forms
1. Variable Situation Decision-Making Training	To make decisions more flexibly and respond to changes in the environment in time.	There are irregular changes in the environment, so players need to constantly observe, judge and react.	Systematic Variation of Training Ideas, Progressive Overload, Process Focus and Practical Match Transfer.	The first two are the basic variations of 2v1/3v2, multi-dimensional scene changes, random formation switches and dynamic space exercises.
2. Limited-Information Fast Decision-Making Training	To enhance the speed of decision-making and stability in the face of change.	It will be reasonable to assume that there are visual occlusions, missing data, etc.	The Training Ideas are Information Limitation, Hierarchical Development, Robustness Orientation and Heuristic Reinforcement.	Its main practice forms include short-term observation decision-making, vision-blocking confrontation, information gap limitation, and ambiguous situation processing.
3. Multi-Objective Conflict Decision Optimization Training	It hopes to make rational assessments and choose the best one among several choices.	It is the process of "option generation, weight evaluation, plan selection and review optimisation".	Its training principles include complete options, weight evaluation, high-frequency scenarios, and retrospective review.	Its main practice forms include single-objective conflict, multi-dimensional composite conflict, key area optimization, and decision review reflection.

Table 1: Overall Design of the Three Decision-Making Training Modules

3.1 Decision-Response Training in a Variable-Situation Stimuli Context

Systematically, controllably and randomly change the circumstances of the training to reduce students' dependence on fixed situations, set paths and combinations, and thus they will have to repeatedly observe information, re-evaluate the current situation and adjust their choices at all times during the exercise to increase their flexibility and adaptability in decision-making. Randomly change the number of defenders, their positions, the speed and space of the ball in the training to gradually increase the cognitive load from one-dimensional variation to multi-dimensional variation. The three are the quality of observation, information filtering and strategy selection. All the exercises are based on the frequent real-life situations of the university football team and can be directly applied in games.

a. Basic Variation Exercise: Organise small-sided games under various conditions, such as 2v1 and 3v2, randomly change the positions of defenders, how long to press, and the level of defence. According to how the defence has been changed, the attacker needs to quickly decide whether to run past, dribble or shoot.

b. Exercise of multi-dimensional variation: Randomly change the number of attacking and defending players, modify the size of the field, goals and time limit in the half-court area. At this time, the players need to make choices and cooperate according to the situation.

c. Aperiodic Formation Variation Exercise: Randomly change among man-to-man marking, zonal

defence, etc., on the defence side. The attacking team should quickly learn about the defensive formation and change the direction of their runs and decisions.

d. Dynamic Space Variation Exercise: The coach or marker cones will be moved to block the passing lane and changed at various times; thus, the players need to constantly be aware of changes in space and react quickly.

3.2 Training for Quick Decision-Making in Uncertain Times

Training will create some artificial information gaps, reduce the amount of available information, and add constraints such as visual obstruction, incomplete information, time pressure, chaos, etc., that do not exist in real games. Teach students how to quickly assess a situation, make reasonable choices and manage risks when they do not know all the details. Training creates information gaps because of obstruction and time constraints, gradually increases the difficulty from a single-cue absence to a multi-cue absence, and finally to a dynamic absence. It is not to find the best answer, but rather to be practical, relatively simple and effective, to help students quickly derive some general rules of thumb for decision-making.

a. Short-term observation decision-making exercise: The coach shows a picture of a game on the screen or an occluding board for only 1-2 seconds and then covers it. Students need to choose a good plan of action for this exercise quickly and learn how to obtain information promptly.

b. Vision-Blocking Decision-Making Exercise: The coach puts up boards or marker cones to block some players and areas in the training field. This exercise is to simulate the situation of being unable to see in the actual game and have the players make decisions based on limited information and anticipation.

c. Information gap confrontation exercise: Reduce the number or length of observations of the players in small-sided games by the coach. The players need to pass the ball and make quick decisions based on the limited information they have.

d. Ambiguous Situation Decision-Making Exercise: The coach creates a chaotic situation by having many players and random paths for the balls and circumstances. Players need to quickly extract the relevant information from the large amount of data and make a reasonable judgment in this task.

3.3 Optimisation Training for Decisions Under Multiple Objectives

Training has many different aims and can be conducted in a short period of time, such as shooting, passing, ball control, breaking through, changing sides, and so on. Help students organise their thoughts by having them list all the choices, consider all the reasons, select a suitable plan, and finally review and learn from their choice. As there is only one option, it will have to choose that one and cannot choose another. Students need to quickly list all reasonable choices, set action priorities based on factors such as time, score, space and risk, and focus on important situations, such as midfield organisation, defence and attack in the penalty area, offensive-defensive transitions, etc. After each practice, it will be compared with the optimal plan to improve the correct decision-making logic.

a. Basic Conflict Exercise: The coach can create a simple conflict situation, such as "shoot or pass", "break through or change sides", or "control the ball or launch a fast break", and have the students make quick decisions.

b. Multi-dimensional conflict exercise: According to all sorts of reasons, such as scores, time, place and number of people, various types of conflicts are created. Students will choose one of the above after considering all of them.

c. Key Scenario Optimisation Exercise: The coach will focus on the important areas of the front of the penalty area, the central midfield area and counter-attack fast breaks to organise multi-objective conflict decision-making exercises. It will help the students solve problems in life.

d. Decision-review exercise: The coach will use videos, provide explanations at the time, have students self-assess and evaluate their peers, and then summarize optimisation rules for decision-making.

4. Conclusion and Outlook

4.1 Research Conclusions

First of all, the students' decision-making ability is an advanced type that results from the joint operation of the three mechanisms of information acquisition and filtering, adaptation to time constraints, and change in strategy. The first two are the speed of information processing and response to pressure.

Second, the students' decision-making ability is limited by the three factors of tactical awareness, the complexity of the competition situation and the training feedback system. The old training model will no longer be supported in the future.

Thirdly, the modular system of the three-in-one training system is in line with the cognitive features of adolescents and the environment of campus football, and it can systematically improve the flexibility, speed, rationality and stability of decision-making in practice.

Fourth, the cultivation of decision-making ability needs to be strengthened in the following three ways: change from passive reaction to anticipation-driven action; alter the type of training from mechanical technical education to cognitive-motor coordinated training; and switch from outcome-oriented evaluation to process-oriented evaluation; finally, all of them should be coordinated to be achieved.

4.2 Research Direction

The theoretical basis and training system to promote students' decision-making ability in campus football have been put forward in this paper to provide a reference for future research and application. However, it is not very deep or wide yet. The following four research directions will be introduced. First, one can use cognitive neuroscience to find out how people make decisions and improve the accuracy of training. Second, based on age, sex and place of residence, long-term follow-up studies will be carried out to customise the training plan. Thirdly, one can study the joint effect of football's decision-making ability, general cognition and academic learning to improve educational value. Fourth, some simple and practical tools can be developed to measure people's ability to make decisions in a quantitative and scientific manner.

The high-quality development of campus football should be based on the all-round development of students' minds. Grassroots coaches need to change their training ideas, integrate the cultivation of decision-making ability into all aspects of their daily coaching, and carry out practice in line with cognitive principles. Thus, all-around development of students' skills, health, knowledge and character in football will be achieved, and a good foundation will be laid for cultivating reserve football talent across the country.

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