Physical Superiority in Football.
An Analysis of the Systematic Development of Conditional Abilities and Their Challenges in Austria's Football Youth Academies

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Abstract

Purpose: This study analyzes the systematic development of physical abilities in Austrian youth football. It highlights the use of training methods and resources as well as the challenges that influence the transition from youth to professional levels. The results provide valuable insights into the prioritization of conditional abilities and identify technical and organizational barriers that could hinder the development of future national players.

Methodology: Through a quantitative survey conducted among all 15 sports science heads responsible for the Austrian football academies certified by the Austrian Football Association (as of February 2024), both the significance and the organizational aspects of implementing strength, speed, and endurance training in training operations were queried. A total of 60% of all distributed questionnaires were included in the actual analysis (9 out of 15 sports science directors).

The same survey was also sent to the heads of sports science at the newly established youth performance centers (NLZ) for the 2023/24 season; however, due to the low response rate (22.2%), they were excluded from further analyses due to the lack of representativeness.

Results: The results showed, among other things, a very high or high acceptance and prioritization of strength and speed training in the weekly training operations, but less priority was given to inclusive endurance training. An negative opinion of the sports science directors was detected regarding the permeability between youth and professional levels. The greatest performance differentiating factor between academy players and players from the professional level was identified as technical and tactical skills, which could also explain the below-average permeability in the clubs.

Keywords: Football, Physical Development, Youth Training, Strength Training

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1. Introduction

The physical preparation of young athletes is an essential foundation for the transition into professional football. Due to the multitude of possibilities and schools of thought, the approach to this preparation for elite sports in the current system is highly dependent on individual persons, mostly the sports science leaders. A standardization of physical training through the umbrella organization (Austrian Football Association, abbreviated as "ÖFB") is not practiced in Austria as of today and does not seem to be effective given the diverse approaches and playing philosophies. In this context, it must be mentioned that, as described, while no standardization prevails, it is necessary for sports scientists, as well as team coaches, to obtain coaching diplomas for future licensing. According to the author, this step can be equated with an indirect standardization through the respective teaching content.

The physical performance of young football players is one of the central prerequisites for success in modern elite football. In an increasingly dynamic and performance-oriented sports world, conditioning abilities such as strength, speed, and endurance are essential components for competitive performance. In addition to technical and tactical skills, physical fitness is considered a crucial factor in meeting the high demands of professional and international football. In this context, national football academies, particularly in Austria, play a significant role in the promotion and systematic development of young players.

The Austrian academy system, overseen by the ÖFB, is designed to train talents for the highest national and international levels. Despite the initiation of uniform ideas regarding playing philosophies and training goals, there is, as previously described, no standardized approach to developing physical abilities.

International studies provide valuable insights into systematic training management and its practical implementation. For example, the weekly periodization in French football academies shows a clear structure in load management. Here, aerobic exercises and technical drills are employed immediately after matches (MD+1 and MD+2) to promote recovery and lay the groundwork for sustainable performance development. More intensive training sessions, such as small-sided games and explosive strength exercises, take place on the days leading up to matches (MD-3 and MD-4) to maximize readiness for play. Such systematic approaches highlight the importance of thoughtful training management, which should consider both short-term competitive success and long-term athletic development.

The situation in Austria presents a nuanced picture: while strength and speed training are recognized and prioritized as central training components in many academies, endurance training often receives less attention. This may be attributed to limited training times, certain endurance forms requiring specific volumes, or a conscious focus on other areas. Another issue is the permeability between youth and professional levels. In England, for example, it has been found that starters and non-starters in football academies exhibit different training volumes, and not all players benefit equally from the training content. A similar problem is reflected in Austria, where the transition from youth to professional structures is often seen as critical, and monitoring over this gray area, end of academy to transition to amateur or professional football, often presents significant organizational or communicative hurdles, leading to spikes in load and thus higher injury probabilities.

This study builds on these findings and focuses on analyzing training management in Austrian football academies. The aim is to investigate how training content and priorities are utilized in the Austrian academy system and what challenges influence the development of conditioning abilities. A particular focus is placed on the decisions and strategies of sports science leaders, whose individual approaches significantly determine the quality of training. Additionally, systemic hurdles and potential solutions are highlighted to improve the training of future national players.

This work aims not only to examine current practices in Austrian football but also to contribute to the discussion on optimizing the physical training of young talents. Ultimately, the central question is how Austria's academy system can better prepare its players for the physical demands of professional football, to ensure greater permeability and, as a consequence, sustainably increase the level of sporting success of the national team through a larger pool of highly qualified, physically superior players.

1.1 Objective and Research Question

In summary, this study addresses the question of how the systematic development of conditional abilities is prioritized and implemented in various Austrian academies, as well as which challenges persist. Furthermore, this work aims to provide an initial objective perspective on potentially improving the transition between youth and professional levels.

1.1.1 Research Question

How are conditional abilities organized and implemented in Austrian football academies, and what specific challenges and issues arise in this context?

2. Methodology

The present study examined the priorities of sports science training management in Austrian football academies, focusing on strength, speed, and endurance training, as well as the associated challenges. Data was collected through a quantitative survey.

2.1 Study design

The questionnaire was created using Google Forms (Google, 2024) and sent to the main sports science responsible parties of the football academies certified by the Austrian Football Association (ÖFB). The aim was to capture the prioritization and practical implementation of training methods as well as organizational hurdles. The questionnaire included:

- **Demographic data:** Information on professional experience
- **Focuses of conditional abilities:** Detailed questions about strength, speed, and endurance training. Due to the potential overlap with the various physiological departments, the area of "flexibility" was deliberately not questioned.
- **Organizational challenges:** Questions about barriers in the internal and external system or integrations of sports science data into everyday training.

2.2 Sample

The survey targeted the sports science directors of all 15 certified football academies in Austria, as well as 9 youth performance centers (NLZ). Due to a response rate of 60%, data from 9 of the 15 academies were included in the analysis. The data from the NLZs were not considered due to a low response rate of only 22.2%, as they could not guarantee representative results. Therefore, all further discussions, evaluations, and statements in this work are limited to the academy operations in Austria.

2.3 Data collection and analysis

The data collection took place between February and March 2024. The analysis of the collected data included:

1. **Quantitative evaluation:** Likert scales were used to assess the prioritization and frequency of training sessions.
2. **Statistical Methods:** Means, median, and standard deviations were calculated to identify central trends. Due to the lower sample size, explicit significance tests were omitted.

2.4 Limitations

The limited response rate could lead to a distorted representation. Furthermore, comparability with international academies is only partially given, as the survey exclusively includes Austrian institutions.

3. Results

In the following section, the results of the various analyses in the individual sections are presented and briefly described.

3.1 Demographic data

The respective sports science directors of the academy had been in their role for an average of 1.8 years (± 0.84 years). Only two main respondents of the survey had been in this position for more than 4 seasons, as shown in Fig. 1.

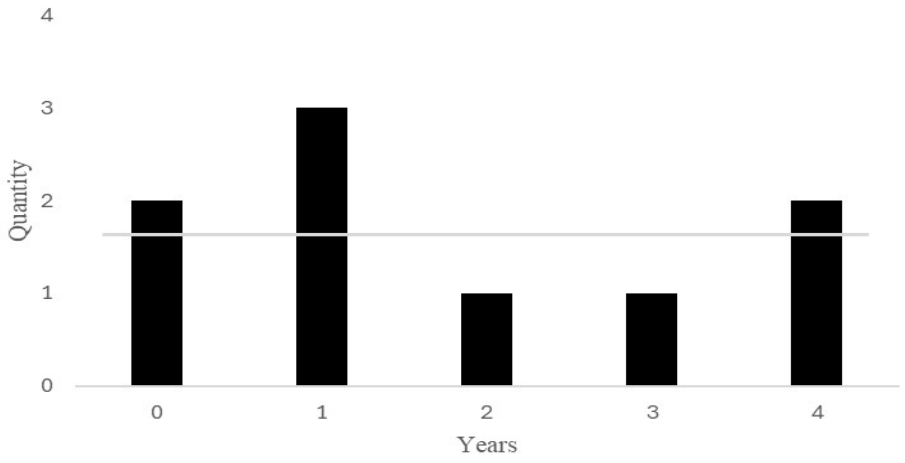

Figure 1: Duration of Employment in Years as the Main Sports Scientist; n=9

3.2 Conditional abilities

The following points will explicitly address the analysis of the responses in the respective, previously mentioned, conditional abilities of strength, speed, and endurance.

3.2.1 Strength training

3.2.1.1 Value

Basically, strength training (Fig. 2) has a very high significance (Md= 9) in the training operations of various academies. With only one outlier, all votes go in the same direction and reinforce the very high priority of strength training in everyday training.

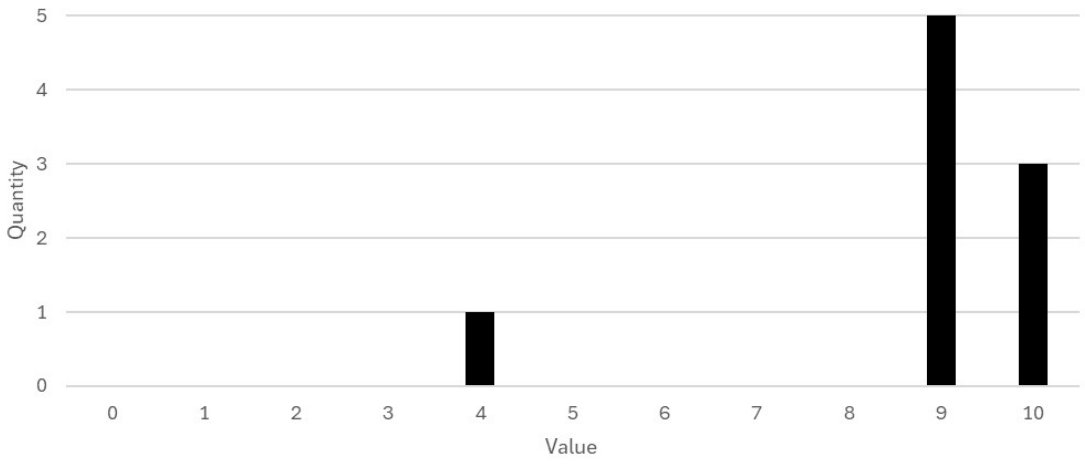

Figure 2: Importance of strength training; 1 = No importance / 10 = Highest importance; n=9

3.2.1.2 Force stimuli per week

After the question of how many training stimuli in the strength area are set per week by team, a different picture emerged (Fig. 3) regarding the distribution within the various age groups U15, U16, and U18. It should be added that specific stimuli of strength training, such as IK-, hypertrophy, or other types of strength training, should be considered in depth, and prevention units or training sessions with a duration of less than 15 minutes should be excluded from the response.

In general, the area of 2 strength training stimuli per week predominates in all age groups (Md= 2). Looking at the general trend, the number of stimuli per week increases, especially between the age groups U15 and U16 (M= 1.89 stimuli ± 0.74 to M= 2.22 stimuli ± 0.63) and then remains similar on average (M=2.33 stimuli ± 0.67) in U18.

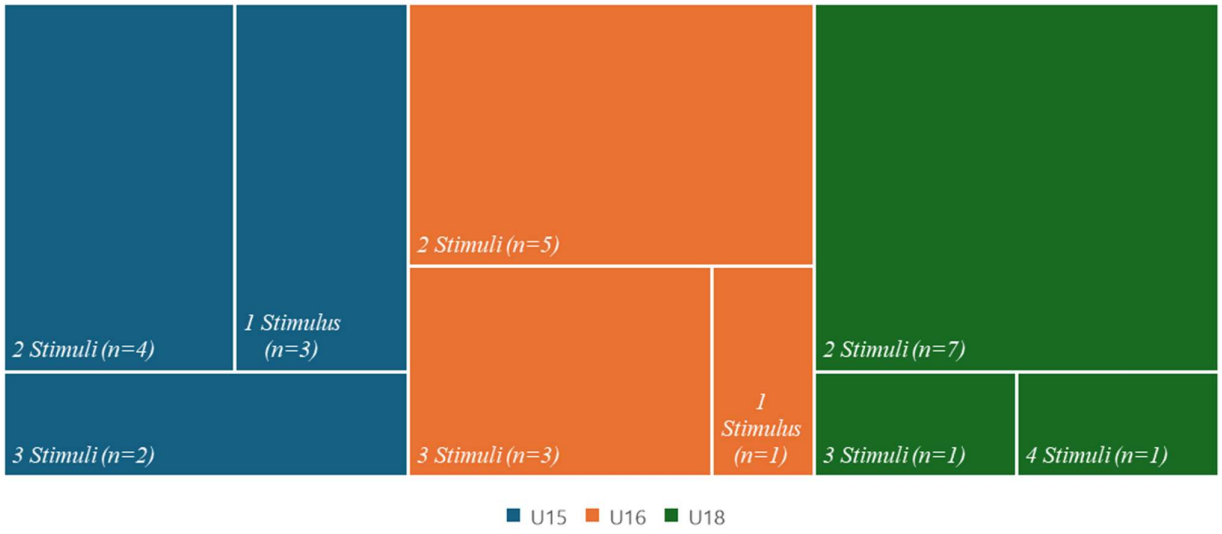

Figure 3: Weekly Strength Stimuli by Age Group

3.1.2.3 Gym sessions per week

Previously, the general stimuli were emphasized; now, this sector focuses on the specific training sessions in the strength chamber. In the U15 category, usually only one session per week is conducted (Md= 1), while it doubles (Md= 2) starting from U16 and remains constant at this level in U18, as shown in Fig. 4.

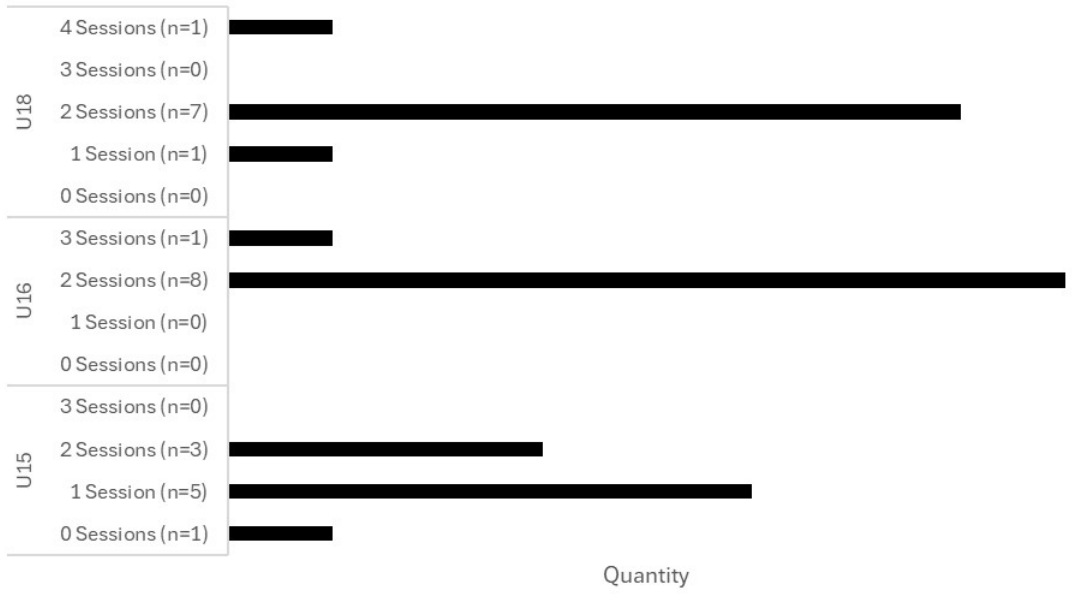

Figure 4: Weekly Units in the Strength Chamber by Age Group

3.1.2.4 Trainings hours per week

In terms of the overall training volume, it is evident that in the U15 category, strength training typically takes 1.5 to 2 hours per week. From U16 to U18, the time spent on strength training ranges from 1.5 to 3 hours per week (88.9%), with the majority (56%) still spending between 1.5 and 2 hours in this range (Fig. 5).

Figure 5: Weekly total Training Volume of Strength Training by Age Segment

3.1.2.5 Weekly training days

Regarding the weekly training days, a similar picture emerges, as seen in Fig. 6. The morning training, which is established in most clubs, is mostly used for strength training. Here, the majority of the sessions for all teams take place on Tuesday mornings (U15, U16 = 66.7%; U18 = 77.8%) or Thursday mornings (U15, U16 = 44.5%; U18 = 66.7%). No strength training is conducted extensively on Wednesday afternoons or Fridays.

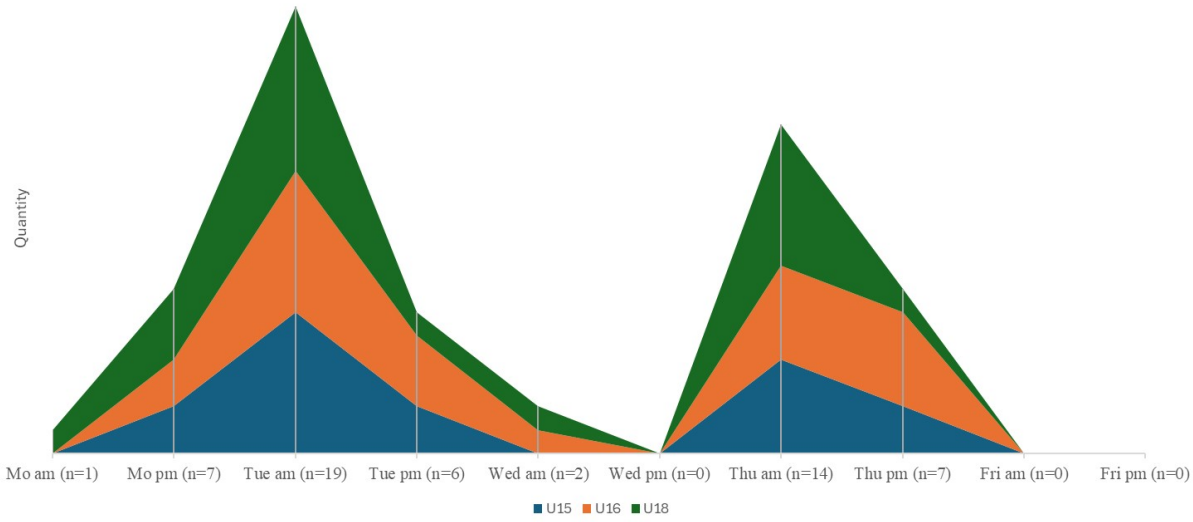

Figure 6: Implementation days of weekly strength training by age segment

3.1.2.6 Key points in the gym

In this section, the focal points prioritized in the respective age groups were questioned. Generally, the area of hypertrophy training is the one most frequently mentioned in the work in the academies (M= 7.33, ± 0.94). On the other end of the continuum (Fig. 7), strength endurance training is conducted the least (M= 2.00 ± 0.82).

If the initial focus in the U15 is primarily on learning the correct techniques in the barbell and dumbbell areas, there is a shift in implementation regarding hypertrophy and Intramuscular Coordination (IC) training upon entering U16. In the last age segment of U18, hypertrophy, IC training, and eccentric training primarily form the focus.

In the "Other" category, plyometric exercises and explosive strength were particularly mentioned, which are mainly carried out in the U18 category.

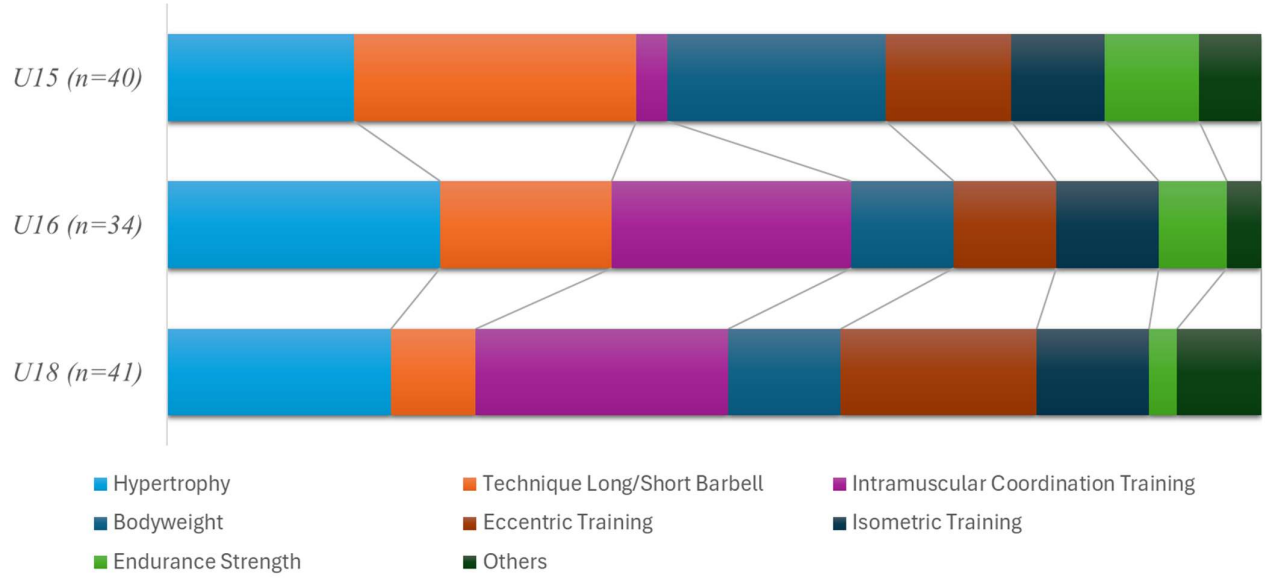

Figure 7: Focus areas of strength training in the strength room by age segment

3.2.2 Speed

In the following section, various questions regarding the area of speed will be analyzed.

3.2.2.1 Value

An explicit speed training within team training holds a high value in the work of Austrian sports scientists (Md= 8; Fig. 8).

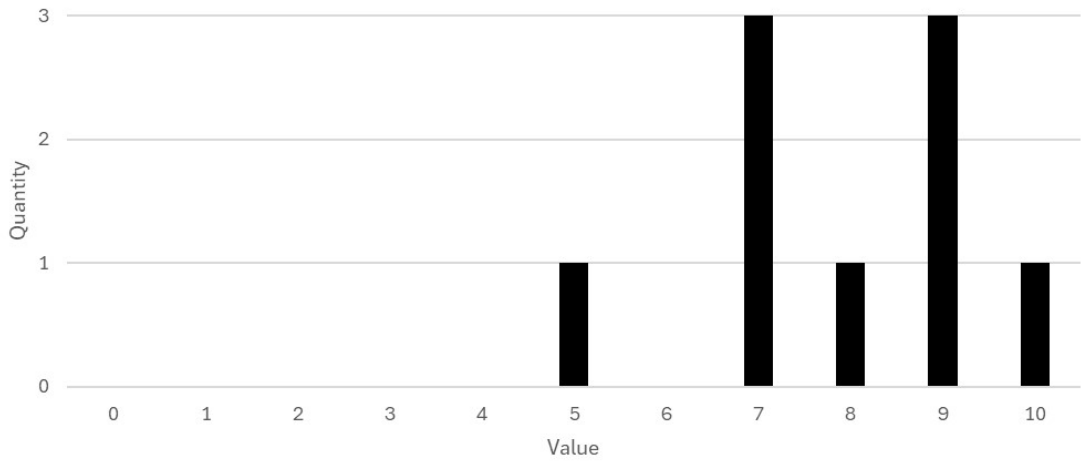

Figure 8: Importance of integrated speed training. 1 = No importance / 10 = Highest importance; n=9

3.2.2.2 Running technique

In this regard, the explicit question was raised as to whether additional time for running technique training would need to be allocated in the respective academy, as there is a deficiency in this area. All responsible parties (100%) see deficits in this area for their players, as shown in Figure 9.

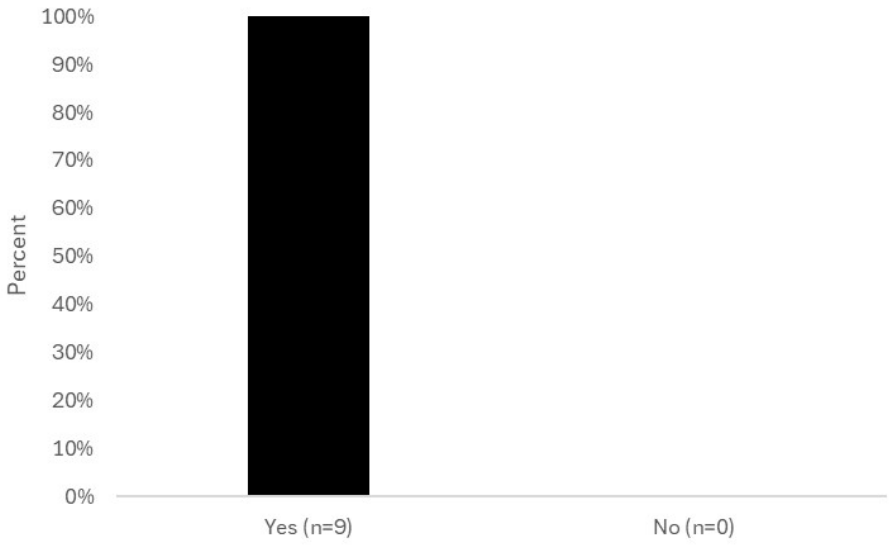

Figure 9: Necessity of explicit running technique training due to general deficits; n=9

3.2.2.3 Main responsibility for running technique

The question following the questionnaire dealt in depth with the previous question and aimed to question the responsibilities of learning the correct technique. In this context, the majority of 67% advocated that this aspect of running technique should begin and be addressed in youth football (ages 10-14). 22% wanted this area to be covered already in children's football (up to 9 years). No responsible person (Fig. 10) agreed that learning the correct running techniques is part of the player's personal responsibility in all phases.

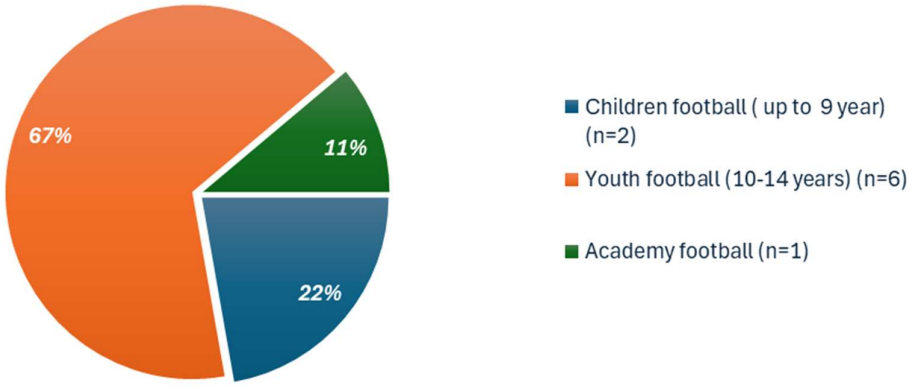

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Figure 10: Main Responsibility for Running Technique Training by Age Groups

3.2.2.4 Running technique in team training

This previously described additional effort in running technique training is mostly covered in the U15 category (66.67%). In the higher levels (Fig. 11), only 44.45% of all academies conduct specific exercises to improve running technique.

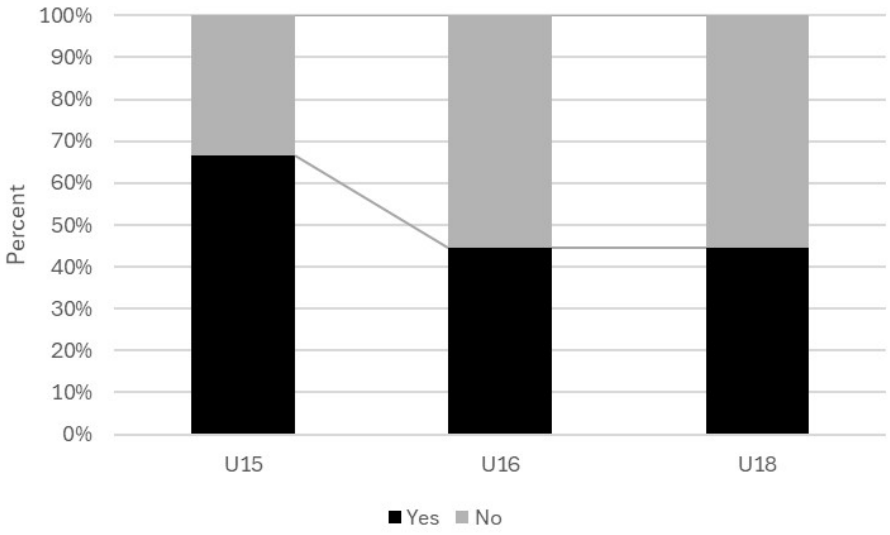

Figure 11: Implementation of running technique training within team training according to age segment; n=9

3.2.3 Endurance

In this section, the results of the specific survey on the conditional ability "endurance" are analysed.

3.2.3.1 Value

The area of training-integrated, explicit endurance training is the one with the lowest priority of all described conditional abilities (Md= 6). In contrast to strength and speed abilities, there is also a broader range of opinions here (M= 6.33, SD= 2.54).

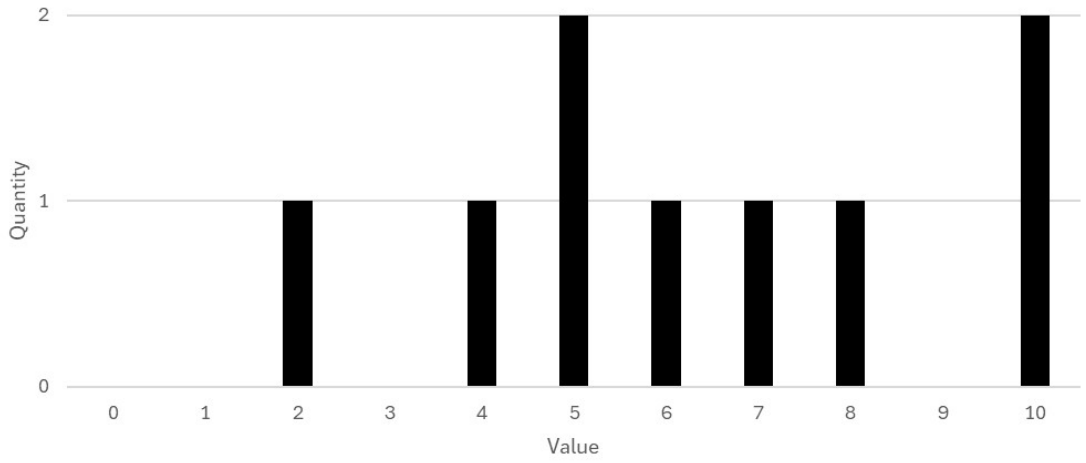

Figure 12: Importance of integrated, explicit endurance training. 1 = No importance / 10 = Highest importance; n=9

3.2.3.2 Key areas of improvement endurance training

Regarding the question of which area of endurance has the greatest development potential in academic training, as seen in Fig. 13, the overwhelming majority of votes were for the aerobic area (53.85%).

Figure 13: Largest potential areas in the endurance sector according to various intensity specifications.

3.2.3.3 Implementation in training routines

When it comes to the question of which values are provided after diagnostics for the players or used for training control (team and home training), most responses (32%) pertained to speed ranges. The remaining responses were almost evenly distributed across the areas described in Figure 14.

Figure 14: Used diagnostic endurance units in training operations

3.2.3.4 Isolated endurance training in team training

More than half of all academies conduct isolated endurance training in team training for both U15 (55.56%), U16 (66.67%), and U18 (55.56%), as seen in Fig. 15.

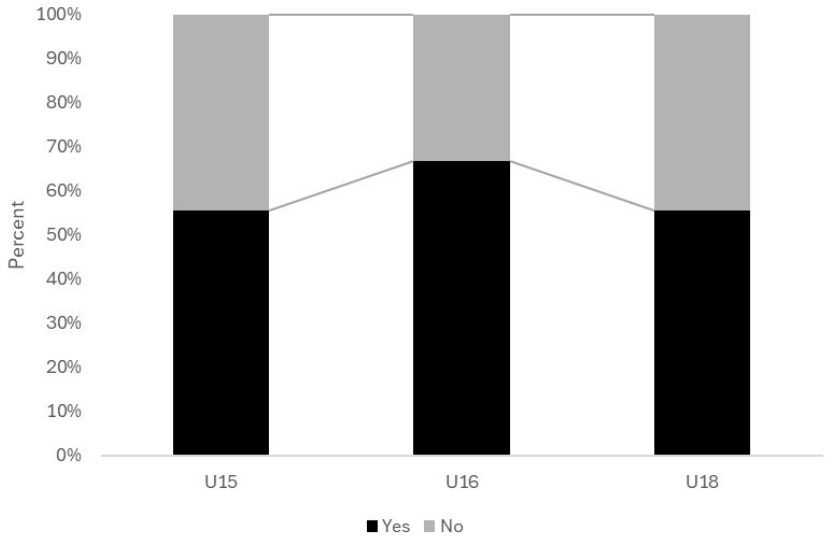

Figure 15: Implementation of isolated endurance training in team training by age segment.

3.2.3.5 Types of isolated endurance training

To specify the previous section, the subsequent question focused on the intensity ranges (Fig. 16) in which this isolated endurance training is conducted within a team context. In this regard, the anaerobic threshold range was most frequently mentioned (45%), followed by that of aerobic runs (27%) and intensities in the mixed range (18%).

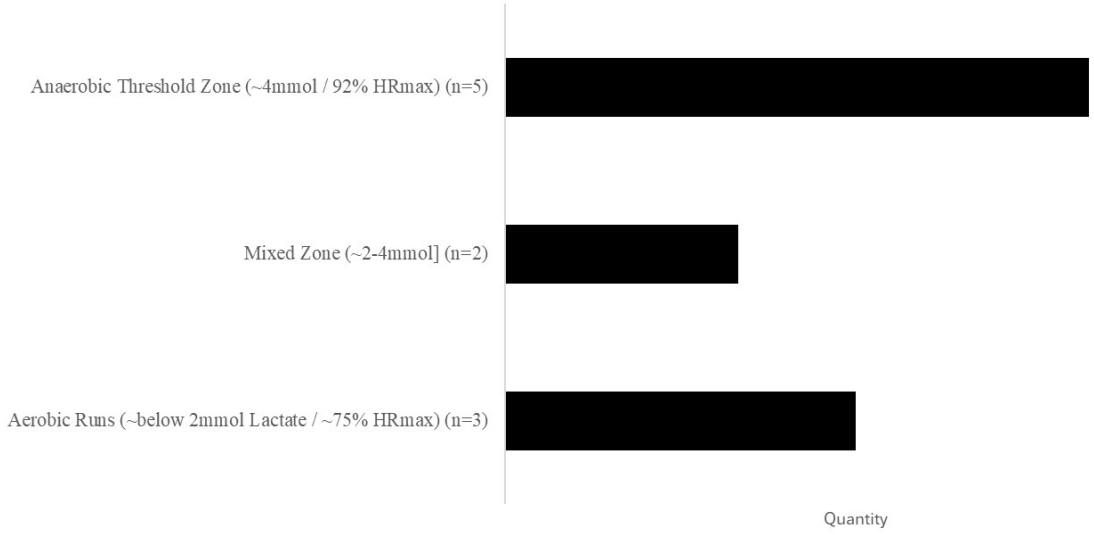

Figure 16: Form of isolated endurance training in team training according to energy provision

3.2.3.6 Value of home programs

Home programs, mostly runs that are conducted away from regular training operations on the field, have a high priority in the planning of various academies (Fig. 17) (Md=8; M= 7.67, SD= 2.11).

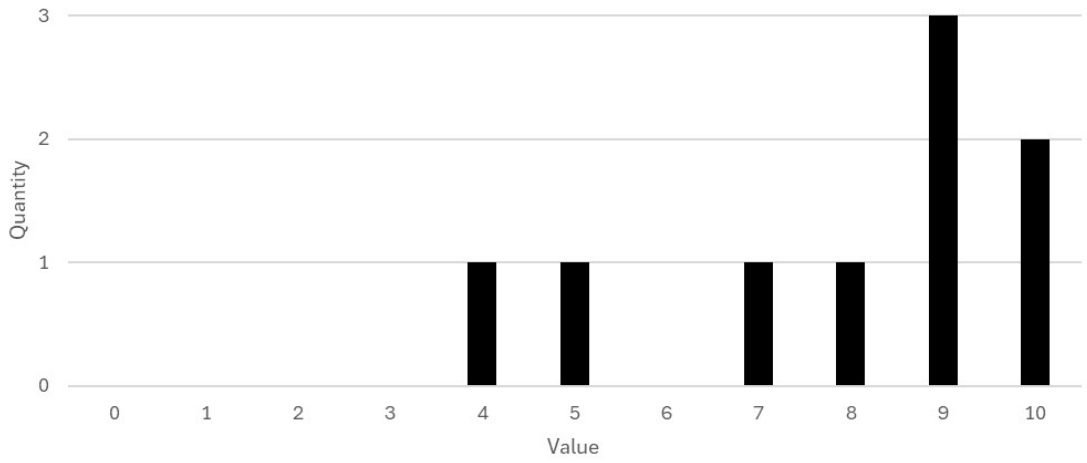

Figure 17: Importance of Home Programs. 1 = No Importance / 10 = Highest Importance; n=9

3.2.3.7 Implementation of home programs

In terms of the generally high importance described earlier, it is no surprise that almost all age groups (except one vote (U15)) conducting regular home programs, as can be seen in Figure 18.

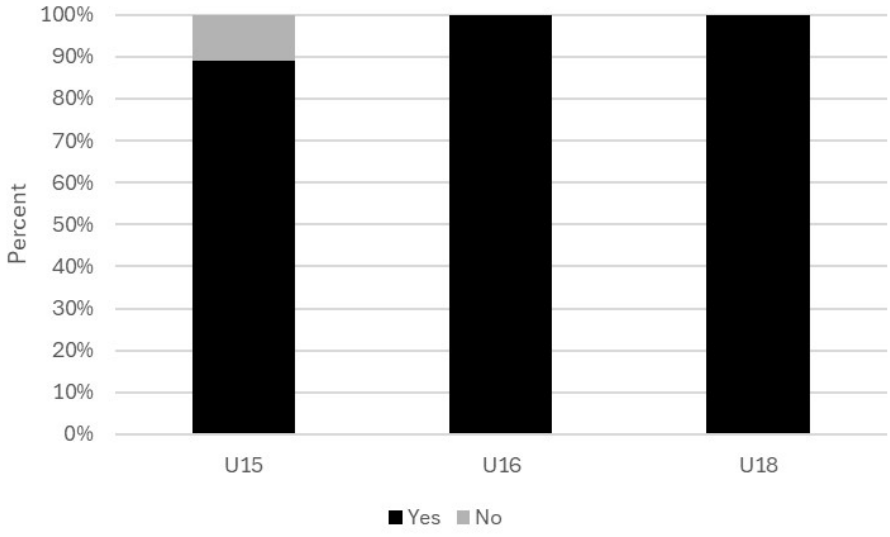

Figure 18: Implementation of regular home programs by age segment; n=9

3.3 Training planning and Club philosophy

In the following, somewhat more general section, questions regarding general training planning and the respective club philosophies in various themes are described. This includes various topics related to match days and training, collaboration, permeability, and the associated potential issues within the academies.

3.3.4 Training planning and implementation of diagnostic values

This subsection will focus on the importance of the general integration of sports science into training and the incorporation of various diagnostic values into operations.

3.3.4.1 Sports science integration in team training sessions

In the question of whether it is relevant for those responsible for sports science to know which specific training contents are carried out by the team coaches (Fig. 19) in order to assess physical reactions. In the U15 area, 44% found it very relevant, while 33% found it highly relevant to know which contents are implemented in daily training. The overall highest relevant value was observed in the U18 category. Here, 88% of all respondents indicated that they see at least a high relevance in knowing the various training contents.

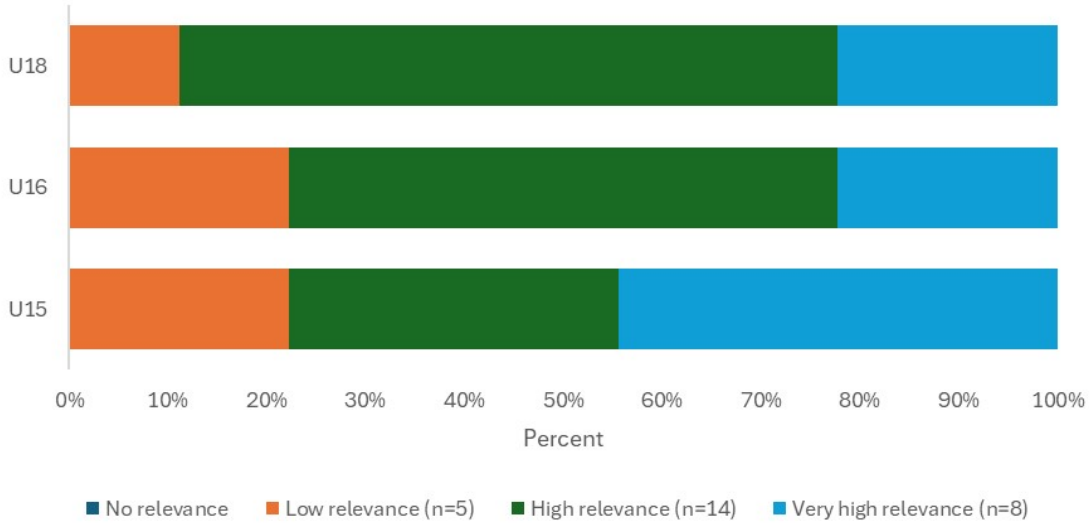

Figure 19: Integration of sports science into team training content for assessing physical reactions.

3.3.4.1 Diagnostic values in team training

In this section, the question is analyzed to what extent various diagnostic values are integrated and utilized in the respective age groups in real training operations. Overall, it was shown that nearly 1/3 of all responses (31%) of the respondents consider it desirable for various values to influence the management of team training (see Fig. 20), but the realization is difficult due to organizational reasons. In 26%, diagnostic values are at least used in individual units. A firm anchoring of values in training operations was observed in 18% of the academies, with the majority of this implementation occurring in the U16 or U18 age groups (15%).

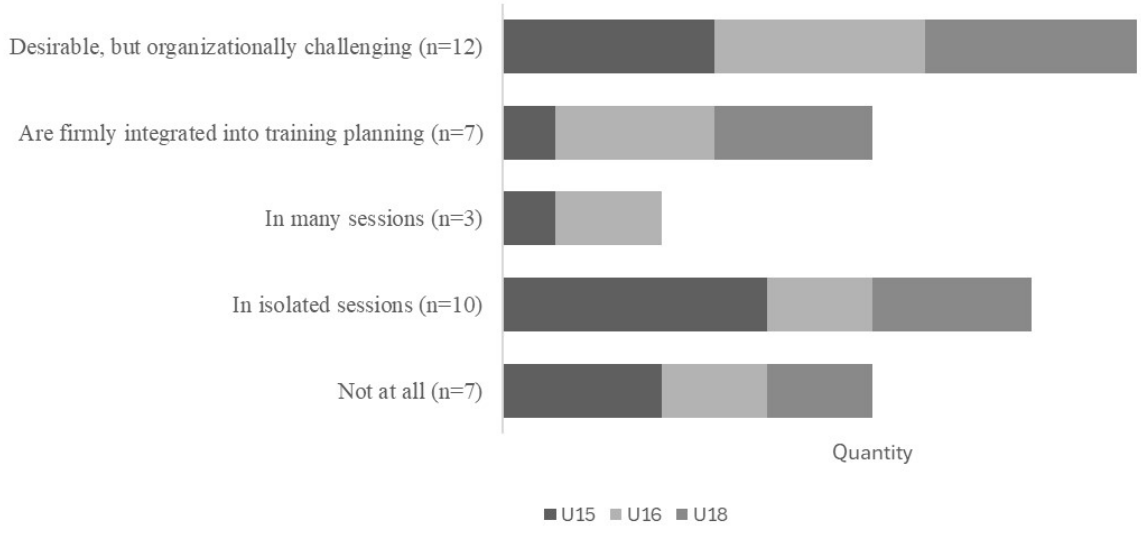

Figure 20: Integration of diagnostic values into team training

3.3.4.2 Diagnostic values in individual player development

To gain a deeper understanding of the use of diagnostic values in academic operations, it was inquired whether the described evaluations are used to promote individual players in order to foster their individual development. While the previous section 3.3.1.2 focused on organizational difficulties, here (Fig. 21) a majority response regarding the implementation for the promotion of potential players was observed (31%). Each 21% use the data for all players or only for players who show drastic deficits in a certain area. Internally, the greatest difference appears in the organizational limitations (inter-category feedback 14%). Here, a difference is particularly evident when comparing the U15 (7%)

and U18 (2%) categories. It seems more challenging to establish the organizational framework in U15 than in U18.

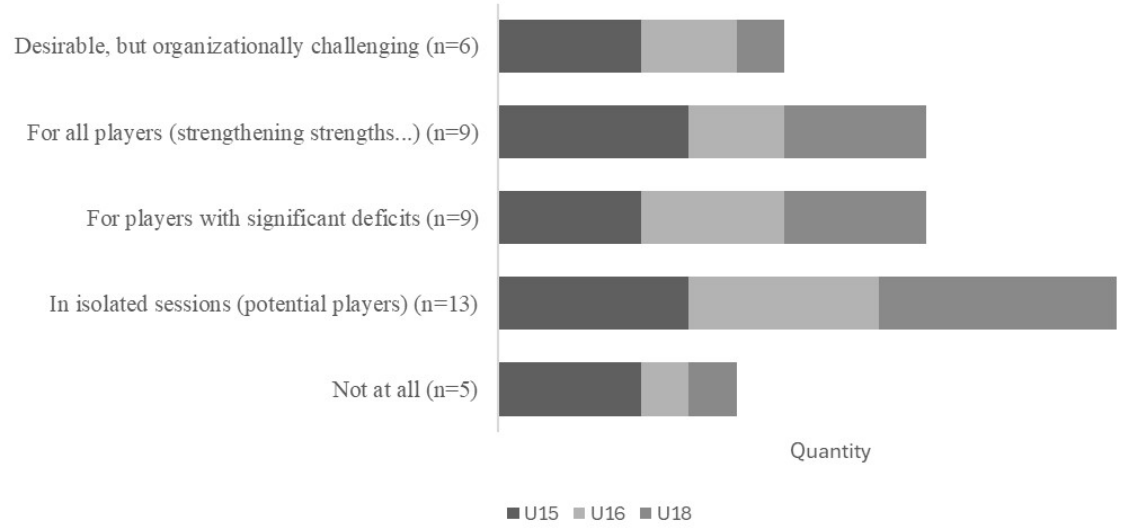

Figure 21: Integration of diagnostic values into individual player support

3.3.5 Club philosophy

The following points will analyze the questions regarding various aspects of the club's philosophy and internal collaboration.

3.3.5.1 Freshness of the players on the weekend

In this subsection, the sports science officials were asked to what extent they feel that the freshness of the players on match day is a priority for the respective team coaches. As shown in the diagram (Fig. 22), opinions vary here. On average, the freshness of the players on match day is given a slightly above-average priority (M= 5.67), with a relatively high variation among the different academies (SD= 2.05).

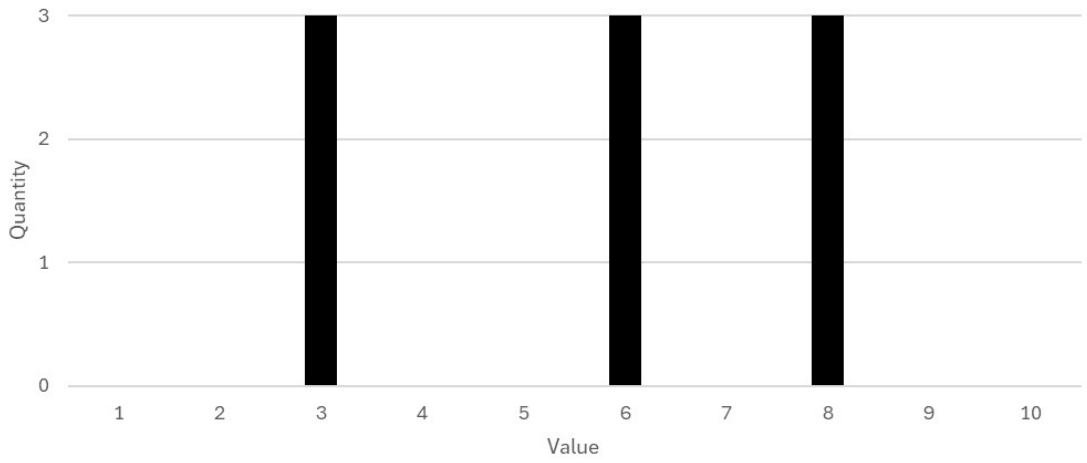

Figure 22: Sense of priority of freshness of players on weekends from the perspective of team coaches. 1 = No priority / 10 = Very high priority; n=9

3.3.5.2 Short-term success or long-term education plan

Subsequently, the question was raised as to whether, within the academy and according to the sports scientists, short-term success (primarily victories on weekends) or a long-term training plan is prioritized. The complete spectrum from 1 (Short-term success) to 10 (Long-term training plan) was provided as a response, with a tendency indicated by a mean value of 6.89 (SD= 2.77), showing a trend towards the implementation of a long-term development plan.

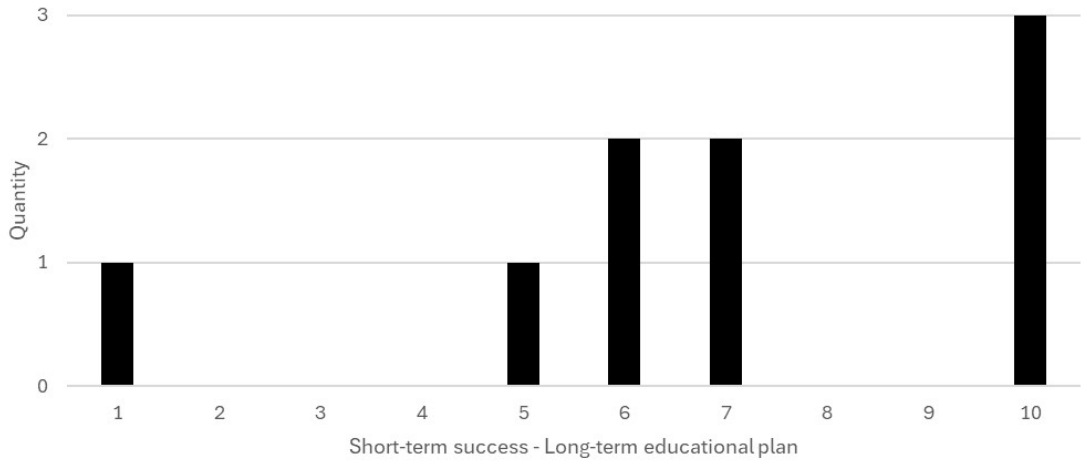

Figure 23: Short-term success or long-term training plan from the perspective of sports scientists. 1 = Short-term success / 10 = Long-term training plan; n=9

3.3.5.3 Cooperation with team coaches

In the question of collaboration between the sports science department and the team coaches of various age groups, a positive collaboration between the areas was evident. The collaboration with the coaches of the U18 age group was rated the highest (M= 7.89, SD= 1.97), followed by U15 (M= 7.11, SD= 1.52). The collaboration with the coaching team of the U16 teams was rated the lowest (M= 6.67, SD= 2.62).

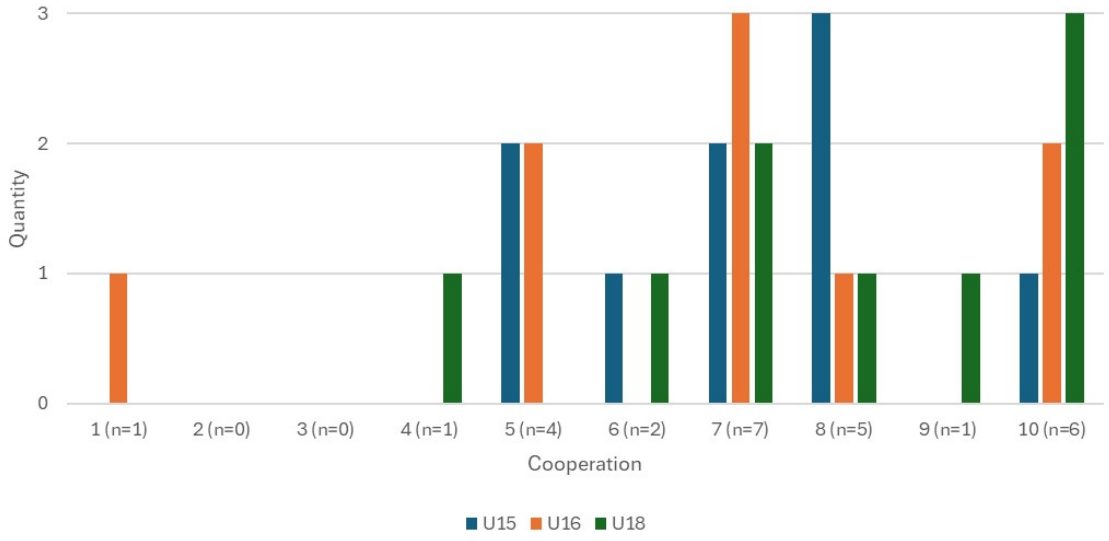

Figure 24: Collaboration with the team coaches from the perspective of the sports science department by age segment. 1 = No collaboration / 10 = Very good collaboration.

3.3.5.4 Cooperation with the medical department

Using the same scheme as in the previous point 3.3.3, the collaboration with the medical department was questioned here. Despite the various levels of the term "medical department," no distinction was made between the individual sub-areas in the question, but rather the general collaboration was inquired about.

The subsequent analysis revealed a very positive picture of the networking of these areas (Fig. 25). With an average rating of 9.11 (SD = 0.99), a very good intra-academic partnership within the country is evident.

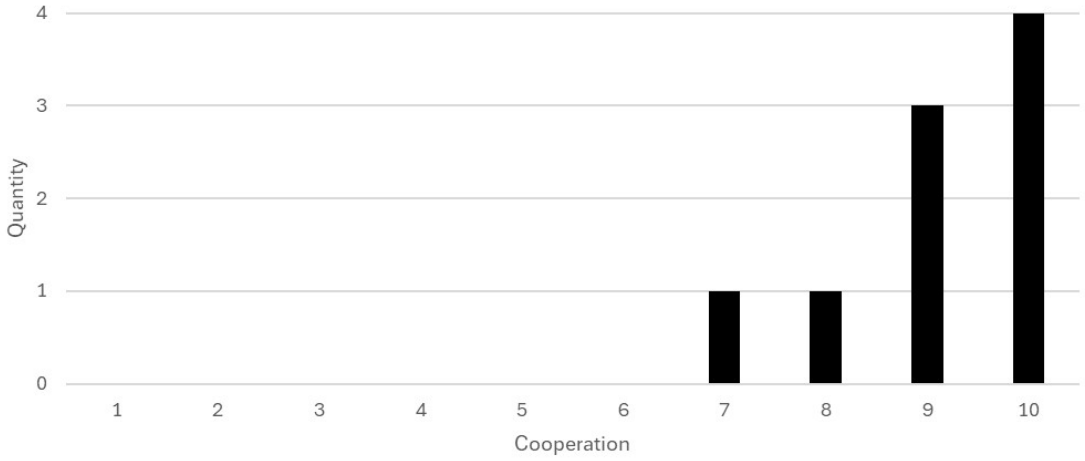

Figure 25: Collaboration with the medical field from the perspective of the sports science department by age segment. 1 = No collaboration / 10 = Very good collaboration; n=9

3.3.5.5 Cooperation with sports directors

In the following analysis section of the collaboration between various areas within Austria's academies, the one with the sports management was inquired. As before, albeit in a milder form, a tendency towards positive cooperation within these departments was also evident here (M= 7.89, SD= 1.59; Fig. 26).

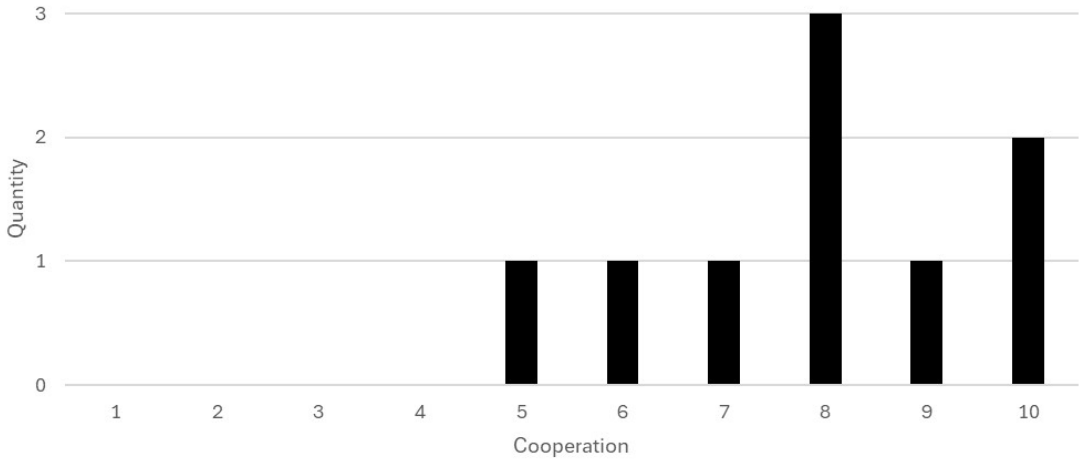

Figure 26: Collaboration with the sports management from the perspective of the sports science department by age segment. 1 = No collaboration / 10 = Very good collaboration; n=9

3.3.5.6 Club-internal permeability

In this section, the question of perceived permeability within the academy towards professional league play (1st or 2nd Bundesliga) is analyzed. This results in an average rating of 4.56 (SD= 2.94), indicating a negative view of internal permeability within the club (Fig. 27). Thus, the arrival of academy players in the first team is met with pessimism.

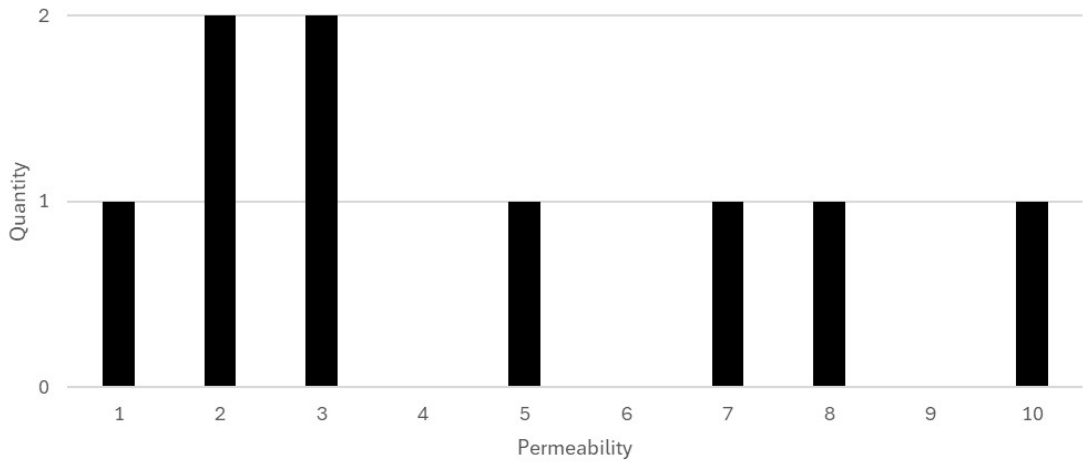

Figure 27: Permeability in the academy from the perspective of the sports science department. 1 = No permeability / 10 = Very high permeability.

3.3.5.7 Key Differences Between Academy and Professional Football

As a logical consequence of the question of permeability, the largest problem areas of academy players regarding integration into professional play were surveyed at the end of the inquiry, as shown in Figure 28. It became evident that with a response rate of 33%, the area of football technical skills was identified by the sports science responsible individuals as having the greatest potential. The sections of tactical understanding and conditional prerequisites were seen as limitations, with 22% and 17% respectively. Looking across categories, more than half of all responses (55%) pertained to the athletic (football technical skills; tactical understanding), 28% to the physical (conditional; muscular prerequisites), 11% to experience,

and 6% to the psychological area of potentially missing competencies for becoming a professional football player.

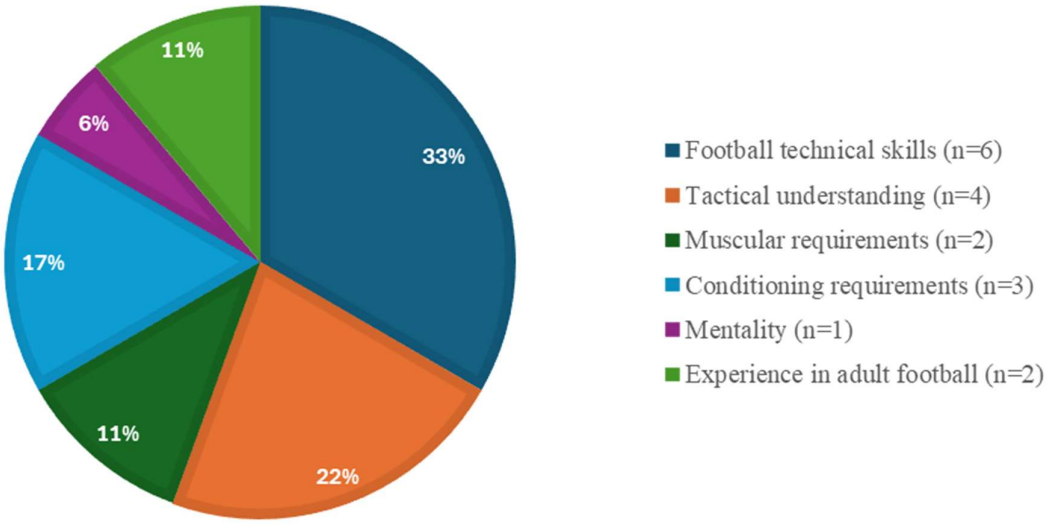

Figure 28: Major limitations regarding increased permeability from the perspective of the sports science department.

3.3.5.8 Overall improvement potentials

In this final question, it was about which of the points described in Figure 29 show the highest potential for improvement within the academy. With 22.6%, the areas of infrastructural and personnel resources were identified as those that could potentially provide the greatest benefit to the work within the academy. In third place, improved communication with the sports management was indicated at 12.9%. Interestingly, the internal position of sports science was mentioned with only 3.23%, reflecting a high level of acceptance of this within the academy setting.

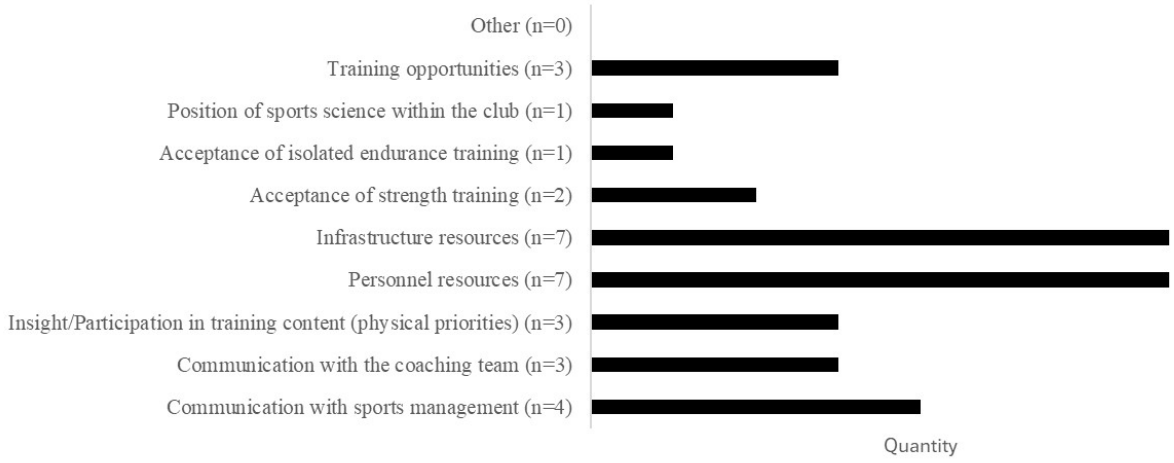

Figure 29: Greatest potential for improvement within the academy from the perspective of the sports science department.

4. Discussion

The present study highlights the strengths and weaknesses of the Austrian academy system in the area of systematic development of conditional abilities. While specific training methods such as strength and speed training are highly prioritized and effectively implemented, the area of endurance training remains underrepresented. These findings raise important questions regarding strategic planning and implementation in daily training routines.

Strength Training: A Strength of the System

The results show that strength training plays a central role across all age groups. Particularly noteworthy is the gradual intensification of training stimuli between the age groups, which corresponds to the demands of modern football and also reflects the natural progression from learning technique to implementation. Thus, the number of weekly strength stimuli increases from U15 to U18, accompanied by a shift in focus towards hypertrophy, IK, and eccentric training in the higher age groups. This prioritization aligns with international best practices and provides a solid foundation for the physical development of the players.

Speed training: Need for optimization in running technique

Another central finding concerns speed training, which also enjoys high priority. However, a clear lack of general running and sprinting technique among academy players has been identified. As previously described, the factor of strength is accepted and practiced as a contributor to speed, but its implementation seems to be hindered by technical deficiencies. The majority of the surveyed sports science directors emphasized that these fundamentals should be established in early youth football (ages 10-14), but in practice, this is often inadequately implemented. This represents a potential weakness, as poor running technique can negatively impact overall performance and injury prevention, making a difference at various levels, from selection between academy age segments to those at the highest levels of football.

Endurance training: A neglected area

Endurance training takes a significantly lower priority compared to strength and speed training. Particularly, the lack of integration of aerobic training sessions into the weekly training plan indicates a gap that could have long-term effects on the players' endurance capacity. Since the aerobic aspect of endurance is primarily volume-dependent, this result is understandable given the limited training time. Although isolated endurance training phases

are conducted, anaerobic intensities dominate, while the aerobic area has been identified as having the greatest development potential. A stronger focus on this area could improve the long-term performance of the players. In this context, home programs, which according to the results are almost universally implemented across all age segments, could serve as a lever to enhance this aerobic performance capacity.

Organizational and systemic challenges

A central point of discussion is the low permeability between youth and professional levels, which is seen as a significant challenge by sports science leaders. The results suggest that technical and tactical understanding are the greatest differentiating factors between academy and professional players. This indicates a discrepancy between physical-athletic and game-tactical development. Additionally, organizational hurdles, such as the integration of diagnostic values into daily training, hinder targeted support for individual player potentials. Furthermore, there lies a significant potential for further development opportunities for academy players in infrastructural improvements and personnel expansion.

4.1 Conclusion and Practical Recommendations

The results of the present study highlight the strengths of the Austrian academy system in physical preparation, but also reveal weaknesses that could hinder the development of future national players. To enhance the permeability and quality of youth training, the following measures should be prioritized:

1. Optimization of training scheduling: Coordination of morning strength training and football training on the same day

Conducting strength training sessions in the morning poses a challenge when intensive football training or matches take place later the same day. Muscular fatigue and reduced recovery time can impair players' performance during football training. Moreover, high physical strain increases the risk of injuries and diminishes the effectiveness of both training sessions. Optimizing the timing and content of these sessions is essential to ensure the quality of both and minimize the risk of overtraining.

A differentiated scheduling approach for strength training sessions (morning vs. afternoon) based on content and age groups could be highly effective. Technical skill sessions or

intermuscular training have less impact on fatigue compared to hypertrophy training and can complement team training. Instead of negatively affecting at least one session, a flexible plan could generate maximal training benefits. In practice, however, such flexibility is often limited by infrastructure constraints.

2. **Promotion of running technique: Early and structured integration of running technique sessions for ages 10–14**

Developing key skills in acceleration, deceleration, changes of direction, and high-speed running aims to maximize the increased strength potential that, as confirmed in this study, is being developed in academies. While athletics techniques can serve as inspiration, football-specific adaptations are necessary due to variable distances, directional changes, and unpredictable situations. These techniques should be tailored specifically for football scenarios.

3. **Focus on aerobic endurance: Increased integration of aerobic training sessions**

Aerobic training should be more extensively included in the training schedule to promote long-term endurance, particularly through a potential reorientation of home training programs. This would help address the time limitations within regular training sessions and foster sustained physical capacity.

4. **Systematics integration of youth and professional divisions**

Developing transition programs that incorporate technical, tactical, and physical aspects is critical. A long-term top-down approach, starting with the professional division, is desirable to ensure alignment and continuity.

5. **Personnel and infrastructure resources: Strengthening scientific and medical departments through targeted investments**

Targeted investments are necessary to enhance the capacity and effectiveness of the sports science and medical departments, ensuring they can support the physical and tactical development of academy players.

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