

Transdisciplinary model for quality control of bachelor's training in “Physical culture”

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Abstract. The article considers the component content of the transdisciplinary model for quality control of bachelor's training in “Physical culture” at the strategic (potential) level, tactical (optimal) level, and operational (subject-operational) levels. Interiorized subjectivity, the awareness of the physical culture process and sports self-improvement, and exteriorized subjectivity are identified as criteria for evaluating the quality of bachelor's training in the "Physical culture". We used the questionnaire "autonomy-dependence" by G. S. Parygin, "Methodology for diagnosing the level of reflection development" by A.V. Karpov to study the feature of transdisciplinary model for quality control of bachelor's training in “Physical culture”. We used a modified questionnaire by V. I. Baidenko to study soft skills forming process. The software "SPSS v 17.0", descriptive statistics, ϕ^* Fischer criterion were used for statistics. As a result of the formative in result of experiment, significant differences in reflexivity are observed. Thus, at the operational level, there is a predominance of retrospective reflection. Differences in the reflection level are identified at the tactical level. Comparison of KG and EG after conducting a formative experiment using the "autonomy" criterion allows us to conclude that there are statistically significant differences ($p \leq 0.01$). Significant differences in the concepts of competencies in KG and EG with an error ($p \leq 0.01$) were identified by the criterion of "maintaining" competencies. Thus, the introduction of a transdisciplinary model for quality control of bachelor's training in the "Physical culture" allows us to introduce innovative changes in bachelor's training based on the methodology of transdisciplinarity.

1 Introduction

In modern conditions, special attention is paid to improving the efficiency of the bachelor's training process as well as to developing innovative models for quality assessment [1]. Transdisciplinarity as an innovative model provides coordination of disciplinary knowledge based on a common axiomatic approach.[2] The transdisciplinarity introduction of bachelors training system in "Physical culture" opens up opportunities for a new scientific discourse in the physical culture and sports theory and methodology. So, E. N. Knyazeva, describing the main directions of modern transdisciplinary research (complexity theory, future research, cognitive science), emphasizes that transdisciplinary research defines the face of modern science [3]. The category "subject" is considered in the context of bodily, communicative, and cognitive determinants in the transdisciplinarity paradigm. Thus, transdisciplinarity is understood as a new direction in the science development. It is aimed at transforming the ways of modern scientific research.

The development of a transdisciplinary model for quality control of bachelors training in “Physical culture” is aimed at integrating various forms and methods [4] of the learning process organizing. It allows to develop the functional efficiency of future physical culture teachers, the ability to stable assess behavior strategies in professional teaching activities.

2 Materials and methods

The empirical study was conducted from September 2019 to March 2020. at the Department of theory and methodology of physical culture and sport; Higher school of physical culture and sport of South Ural State Humanitarian-Pedagogical University, Chelyabinsk, Russia. The study involved 120 people aged 18 to 22 years.

We identified motivational, contextual and reflexive components [1] of the evaluating the quality of bachelors training in Physical culture. Our model is realized in a special environment – a transdisciplinary one. The subjectivity links the components and levels of the model into a single conceptual context.

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Organizational and methodological problems are solved at the operational (subject-operational) level of quality control of bachelors training in Physical culture. Transdisciplinary modification of the bachelors preparation process in Physical culture is carried out on the basis of practice-oriented disciplines: summer sports, outdoor games, complex coordination sports, game sports, youth sports, high-performance sports, sports training in cyclic and acyclic sports. The disciplines are united by the formation of physicality as an epiphenomenon of human existence [5]. In the process of mastering practice-oriented disciplines, physicality is associated with those specific learning situations in which subjectivity is formed. The realisation of the model for quality control at the operational level is aimed at transdisciplinary updating of the educational tasks structural units. First of all, there is transdisciplinary concretization and detailing of the goal. Secondly, there is transdisciplinary modification of the training content [1]. In the third, there is a shift in the orientation of bachelors cognitive activity (from the result, the emphasis shifts to the process of solving the educational problem, causing the formation of post-voluntary attention mechanisms). Transdisciplinary actualization realizes the conditions for bachelors training in Physical culture and links the learning goal and the educational task components.

We identified interiorized subjectivity as a main criterion for evaluating the quality of training. It reflects the ability of future physical culture teachers to act autonomously [6] and reflexively.

Realization of the bachelors' potential and the subject-oriented embodiment formation is carried out in the framework of transdisciplinary individualized learning [11]. We identified the awareness level of physical culture and sports self-improvement as a criterion for transdisciplinary assessment. [4]. The process of potential capabilities realization includes introspection, understanding of individual experience, and pedagogical self-awareness. It allows us to include the "I-concept" of a bachelor in the context of personal self-improvement. Awareness of the physical culture and sports self-improvement process also implies the development of self-perception, reflexivity [7]. It is aimed at one's own body in the process of transdisciplinary assessment of motor acts. Leontiev [8] notes that subject-object relations in reflexion are presented in areflexion, introspection, quasi-reflexion, and system reflection. The "negative modality" of reflection appears when perception of the real situation is deformed. The "positive modality" of reflection is related only to systemic reflection. Consequently, awareness of the physical culture and sports self-improvement process in the context of systemic reflection is a focus on transdisciplinary assessment of the physicality formation.

Realization of a transdisciplinary model at the tactical level implies the possibility of training variatization. We introduced transdisciplinary links into the structure of the learning process. They provide the possibility of transdisciplinary training form modification, the level of the task complexity, the variability of its content, etc. [1].

The goal of the strategic (potential) level of the quality control is to implement strategies for improving the key and soft skills competencies [9] of future physical culture teachers. In our opinion, transdisciplinary assessment methods are very important in the development of diagnostic tools for quality assessment [1]. Overcoming stereotypical ideas about the process of studying at a University, solving problem situations in the learning process is possible only on the basis of exteriorized subjectivity. The implementation of transdisciplinary educational technologies in the learning process at the University is one of the basic conditions. This is a holistic mechanism of the soft skills competencies, formation of the subjective position and transdisciplinary change forms, methods, techniques, and technology training.

The questionnaire "autonomy-dependence" by G. S. Parygin [10], "Methods of diagnostics of the reflection development level" by A.V. Karpov [6] were used as psychodiagnostic methods aimed at studying the criteria for evaluating the quality of bachelors training. The attitude to the process of forming soft skills competencies was studied using a modified questionnaire by V. I. Baydenko [11]. SPSS v 17.0 software, descriptive statistics, and the Fisher criterion were used for statistical processing of measurement results.

3 Results and discussion

The formative experiment was conducted in natural conditions and was aimed at implementing a transdisciplinary model for evaluating the quality of bachelors training in physical culture. There were a CG (control group) and an EG (experimental group) formed.

After conducting the formative experiment, there is a change in the indicators for evaluating the quality of bachelors training in physical culture in the EG. Significant differences in operational and tactical ($\varphi * EMF = 2.34$ with $\varphi * CR = 1.64$ ($p \leq 0.05$) and $\varphi * CR = 2.31$ ($p \leq 0.01$)) levels are associated with such an indicator as reflexivity. The predominance of retrospective reflection ($\varphi * EMF = 2.46$ at $\varphi * CR = 1.64$ ($p \leq 0.05$) and $\varphi * CR = 2.31$ ($p \leq 0.01$)) and the reflection of this activity ($\varphi * EMF = 3.41$ at $\varphi * CR = 1.64$ ($p \leq 0.05$) and $\varphi * CR = 2.31$ ($p \leq 0.01$)) at the operational level compared to the tactical level is primarily explained by the tasks and methods of organizing the training process. So, at the operational level we used the methods of "soft assessment", training through binary thematic oppositions. At the tactical level, transdisciplinary methods became more complex. The elements of background training were introduced. The future physical culture teachers were trained to solve "supra-situational" tasks aimed at forming the psychological effectiveness of the individual.

At the strategic level the reflexivity is smoothed [12] by increasing the values of "future profession", "reflection of communication and interaction with others", in comparison with subjects operational ($\varphi * EMP = 2.68$ at $\varphi * CR = 1.64$ ($p \leq 0.05$) and $\varphi * CD = 2.31$ ($p \leq 0.01$) and tactical levels ($\varphi * EMP = 2.62$ at $\varphi * CR = 1.64$ ($p \leq 0.05$) and $\varphi * CD = 2.31$ ($p \leq 0.01$)). As transdisciplinary assessing methods at the strategic level, we used the methods of coaching and

pedagogical supervision. They are also methods of forming reflection. The learning process becomes the semantic center of coaching and pedagogical supervision, enriching these methods by including the "system reflection" mode. It allows us to see both the interaction situation itself in all its aspects as well as alternative possibilities.[8]

Comparison of CG and EG after conducting a formative experiment using the "autonomy" criterion allows us to conclude that there are statistically significant differences ($p \leq 0.01$). The increase in the share of the "autonomy" criterion in the EG is due to the specific methods of the transdisciplinary model. They are focused on "stating" changes as well as on active transformation and impact [4] on bachelors' subjectivity. We used the modified V. I. questionnaire by V. I. Baidenko [11], to investigate the bachelors' attitude to the process of forming soft skills competencies [9] in the learning process. Statistically significant differences in the concepts of competencies in CG and EG with an error of ($p \leq 0.01$) were identified by the criterion of "maintaining" competencies ($\varphi * EMF = 3.46$ with $\varphi * CR = 1.64$ ($p \leq 0.05$) and 2.31 ($p \leq 0.01$)). The soft skills competencies are recognized as important and achievable by the EG respondents. It allows us to conclude that the transdisciplinary model for quality control of bachelor's training in physical culture is effective.

Thus, the introduction of a transdisciplinary model provides a special significance of the bachelors' subjectivity [6], fills the learning process in higher education with a new meaning [1], providing a transition to an active transformation of the learning process.

4 Conclusions

The results of the transdisciplinary model effectiveness empirical study allow us to draw the following conclusions.

The main criteria of transdisciplinarity are interiorization subjectivity, awareness of the process and outcome of sports-improvement, exteriorization subjectivity. As indicators of criteria, we identified autonomy, reflexivity, and the attitude of bachelors to the process of forming soft skills competencies in the learning process. The realization of the transdisciplinary model was carried out in the process of applying the methods of "soft assessment", training through binary thematic oppositions, methods of background training, solving "supra-situational" tasks, methods of coaching and pedagogical supervision. The transdisciplinary model allows us to introduce innovative changes in bachelor's training based on the transdisciplinarity methodology [3].

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