Research in Physical Education, Sport and Health
2025, Vol. 14, No. 2, pp.47-54
ISSN(Print):1857-8152; ISSN(Online):1857-8160

COMPARATIVE ANALYSIS OF THE MACRO-DIDACTIC STRUCTURE OF PHYSICAL EDUCATION TEACHING IN THE FIRST EDUCATIONAL PERIOD ACCORDING TO TEACHING STAFF

DOI: https://doi.org/10.46733/PESH2514247p
(Original scientific paper)

Luka Popovski
University Ss Cyril and Methodius, Faculty of physical education, sport and health, Skopje, N.Macedonia

Abstract

Modern teaching models, created in order to overcome the shortcomings of the traditional system and represent a kind of attempt to innovate the teaching process. One of such models is the "tandem teaching of physical education in grade school". The preparation of the teaching precedes the planning, and especially what follows after it, should be understood as a complex of various mental and practical-operational activities aimed at providing necessary and relevant conditions for the correct, efficient organization and implementation of the educational activity. This paper investigated the differences in the application and significance of the macro didactic structure between two models of physical education teaching in the first educational period. The differences in the macro didactic structure between two models of teaching physical education in the first educational period, depending on the teaching staff, is determined by T-test for independent samples (groups). The total number of respondents in this research is 220, where 104 are respondents who teach physical education in a model - independent class teacher, 116 are respondents who teach physical education in a model - tandem teaching (with a physical education teacher included). The macro didactic structure was assessed with a survey questionnaire that determines the quantitative components of the macro structure of physical education teaching in the first educational period, through the meaning of: the initiation of the teacher and the initiation of the student, the course and realization of the teaching, the educational effects in the teaching, compatibility or prior knowledge, the role and status of the student and the role and status of the teacher, the language and speech used in the teaching, verbal and non-verbal communication between subjects, climate and atmosphere during teaching and technological support. From the data analysis of the macro didactic components, it can be seen that the teachers from the two models of physical education do not show any differences in the application and significance of their incorporation or structuring for one year and in their global articulation (shaping) of the teaching material (operational tasks of separate thematic areas), in their global articulation of organizational forms of work and in their global distribution by estimated and numerical representation, as well as in their planning within annual (seasonal) or thematic units. Based on the obtained results, it was concluded that there is no statistically significant difference in the application and meaning of the macro-method didactic components between the two models of physical education depending on the teaching staff.

Key words: *Models of physical education, macro didactic structure, students, differences.*

Introduction

Contemporary educational discourse increasingly emphasizes the need to create pedagogical conditions that respond to the developmental, social, and educational needs of children growing up in the twenty-first century. This demand does not imply a rejection of established educational traditions; rather, it calls for their critical re-examination and renewal through the integration of innovative approaches that align with modern societal challenges. As Damovska (2022) argues, the development of a new pedagogy requires renewed curricular perspectives, enhanced professional commitment from teachers, a redefined vision of schooling, and a more thoughtful consideration of the educational use of time and space. Within this framework, the preservation of proven educational values, combined with carefully introduced innovations, becomes essential for shaping an interconnected and sustainable educational future. Within this framework,

physical and health education occupies a distinctive position due to the movement-based and experiential nature of its content. As Vilotijević (1992) points out, physical education differs from other school subjects in that it is primarily oriented toward direct psychomotor engagement and holistic development. Despite substantial diversity in instructional organization across educational systems, physical education worldwide is unified by a common educational mission. According to Hardman (2009), this mission is reflected in the promotion of lifelong physical activity and in the development of the concept of the "physically educated individual," which integrates physical competence, health awareness, and positive attitudes toward movement.

In the early educational period, physical and health education plays a particularly important developmental role. Instructional content should be aligned with children's age-specific physical, cognitive, and emotional characteristics, with a strong emphasis on play-based learning and appropriately structured activities. Given that children at this age have a limited capacity for abstraction, the quality of demonstration and task organization becomes crucial. As Vilotijević (1992) notes, inadequately structured instruction and poor demonstration may result in incorrect movement patterns, which can negatively affect further motor learning and development. This highlights the importance of systematic planning and structuring of the teaching process. In response to the limitations of traditional instructional approaches, contemporary teaching models have emerged with the aim of improving instructional quality and addressing students' diverse developmental needs. One such approach is tandem teaching in primary school physical education, which is based on differentiated didactic roles of the teaching staff during planning and implementation. Within this context, the analysis of macro-didactic elements becomes particularly relevant, as these elements shape the overall organization, coherence, and effectiveness of instruction.

The teaching process itself is structured through interconnected lesson components whose organization and sequencing form what Vilotijević (1992) defines as the articulation of teaching work. Teaching is understood as a complex, goal-oriented process aimed at students' cognitive, affective, and physical development, with long-term objectives operationalized through clearly defined teaching tasks. From a methodological perspective, Tasevska (2012) emphasizes the need to integrate both micro- and macro-didactic structures, whereby macro-didactic elements encompass annual, seasonal, and thematic planning, as well as the global distribution of content and organizational forms. Similarly, Vilotijević (1999) highlights that such macro-level planning provides coherence and continuity to the instructional process.

In physical education, the application and significance of macro-didactic elements largely depend on the organization and competencies of the teaching staff. According to Anastasovski (1999), the macro-didactic structure serves as an empirically grounded indicator of instructional quality, as it reflects the systematic articulation of content, organizational forms, and teaching objectives. Accordingly, this study examines the application and significance of selected macro-didactic elements in primary school physical education, with particular attention to differences related to the teaching staff, in order to contribute to a clearer understanding of the organizational foundations of quality physical education teaching.

Methods

This paper investigated the differences (relationship) of the macro didactic structure between two models of Physical Education teaching in the first educational period. This shows the basic problem of the research.

The subject of this research is the macro didactic structure between two models of teaching physical education in the first educational period, depending on the teaching staff.

The main goal of this research is to determine the differences in the macro didactic structure between two models of teaching physical education in the first educational period, depending on the teaching staff.

Tasks in the research is to determine if there are differences in the macro didactic structure of physical education teaching between the two applied models, depending on the teaching staff.

The respondents in the research are the teaching staff from grade III and are in an educational process with a different model of physical education teaching.

This type of respondents was selected considering different models of physical education that are included in the educational process, in order to perceive their grades (evaluations) about the meaning and application of the didactic structure of the teaching of physical education for the first educational period.

The total number of respondents in this research is 220, where 104 are respondents who teach physical education in a model - independent class teacher, 116 are respondents who teach physical education in a model - tandem teaching (with a physical education teacher included).

The survey was conducted in departments that implemented different models of teaching physical education. The macro didactic structure was assessed with a survey questionnaire that determines the quantitative components of the macro structure of physical education teaching in the first educational period. The questionnaire was compiled by the authors of the paper.

This method is implemented in order to obtain primary data on the didactic structure (macro) for the teaching of physical education, in the first educational period. The survey served to examine the meaning and applicability of the macro components of physical education teaching.

The examination is structured, where pre-prepared and defined questions are used, that is, a formal list of questions, arising from the goals and tasks of the research.

The survey is of a closed type and the scale used to perceive the macrodidactic structure of physical education teaching is of the 5-point Likert type, ranked from 1 to 5, and consists of 12 particle-items for evaluating the meaning and application of the macrodidactic structure. For each answer in the scale, a category with degrees of agreement is indicated.

The survey questionnaire referred to the macro-didactic structure of the course in physical education, where the respondents gave their assessment (evaluation) of the global articulation of the curriculum.

The differences between teaching staff who teach in different models of physical education is determined by T-test for independent samples (groups). The data were processed with a statistical package STATISTICA 12.

Results and discussion

In order to determine whether there are differences in the macro didactic structure between two models of teaching physical education in the first educational period, depending on the teaching staff, it was applied T-test for independent samples (groups).

Namely, here the goal was to determine if there are differences in the macro didactic structure between groups from different models of physical education

From *Table 1,* it can be seen that each statistical test starts from a null hypothesis. In all cases, the null hypothesis is that there is no statistically significant difference between the groups. So with the T-test we check if there is and what is the difference in the average macro didactic components between the groups based on their teaching staff. If the difference turns out to be statistically significant, we reject the null hypothesis and accept the alternative hypothesis of existence of differences.

From *Table 1*, we see that the probability of the null hypothesis being correct is extremely high, i.e. greater than 0.05, therefore we accept the null hypothesis and conclude that there are no differences in all 12 macro didactic components between the two models of physical education based on of their teaching staff.

Table 1. T-test for determining differences in macro didactic components between physical education models based on teaching staff.

Macro didactic Components	Mean 1	Mean 2	t-value	df	P	Valid N 1	Valid N 2	Stan. Dev. 1	Stan. Dev. 2	F-ratio Variances	P Variances
Teacher initiative	3.96	4.12	-1.56	218	0.12	104	116	0.79	0.72	1.18	0.38
Student initiative	4.06	4.14	-1.01	218	0.31	104	116	0.60	0.57	1.11	0.58
Flow and realization	3.96	3.93	0.32	218	0.75	104	116	0.76	0.64	1.41	0.07
Educational effects	3.83	3.93	-0.97	218	0.33	104	116	0.76	0.83	1.21	0.33
Compatibility	3.96	3.98	-0.20	218	0.84	104	116	0.65	0.88	1.84	0.00
The role of the student	4.12	4.12	-0.06	218	0.95	104	116	0.73	0.65	1.26	0.22
The role of the teacher	4.04	4.09	-0.43	218	0.67	104	116	0.76	0.86	1.27	0.21
Language and speech	3.87	4.00	-1.23	218	0.22	104	116	0.80	0.82	1.06	0.78
Verbal communication	4.10	4.25	-1.73	218	0.09	104	116	0.66	0.66	1.01	0.95
Nonverbal communication	3.83	3.95	-1.09	218	0.28	104	116	0.78	0.86	1.22	0.30
Climate and Atmosphere	4.52	4.59	-0.93	218	0.35	104	116	0.57	0.49	1.35	0.12
Technology	3.40	3.29	0.76	218	0.45	104	116	1.03	1.12	1.18	0.38

If we look at the individual macro didactic components between the two applied models of physical education, it is evident that the teaching staff of both models show great application and give great

importance to the incorporation or structuring that includes and determines the quantitative components of the macro structure of physical education teaching in the first educational period.

In the *Teacher Initiative* component, although a slightly higher arithmetic mean is observed in the second group ($M_2 = 4.12$) compared to the first ($M_1 = 3.96$), the determined difference is not statistically significant ($p = 0.12$). This indicates that the teaching staff, regardless of the model applied, show a similar level of activity and initiative in planning and implementing teaching. Regarding *Teacher initiative*, although slightly higher mean values were observed in the second group, the absence of statistical significance suggests that teacher professional autonomy operates within clearly defined didactic boundaries**.** This finding is consistent with the work of Mosston and Ashworth (2008), who argue that while teaching styles may vary, overarching instructional decisions remain constrained by curricular demands, time allocation, and institutional expectations—particularly in early primary education. In this context, the absence of statistically significant differences does not indicate a lack of teacher initiative, but rather reflects its systemic regulation and standardization within formal education. This interpretation is further reinforced by the view offered by Tasevska (2012), who emphasizes that teacher initiative plays a crucial role in monitoring curriculum parameters, modernizing the teaching process, applying diverse didactic–methodical tools, and fostering students' active participation in the acquisition of knowledge, skills, and abilities. According to Tasevska, teacher initiative represents a key pedagogical competence that enhances instructional quality, yet its expression is often shaped by the broader educational framework within which teachers operate.

A similar trend is observed in *Student initiative*, where both groups achieve high mean values ($M_1 = 4.06$; $M_2 = 4.14$), without a statistically significant difference ($p = 0.31$). This can be interpreted as an indication that the teaching models equally enable active participation and initiative of students, which is in line with modern didactic principles of student-centered teaching. Similarly, the lack of significant differences in *Student initiative* supports constructivist perspectives indicating that student engagement is influenced more by pedagogical culture and classroom norms than by formal instructional models alone (Kirk & Macdonald, 1998). In physical education, opportunities for student initiative are often embedded in task design and activity structure, which tend to remain consistent across models when aligned with the same curriculum.The present findings are further contextualized by the perspective of Tasevska (2012), who highlights that student initiative holds particular pedagogical significance, as it positions the student as an active and equal partner in the teaching process. According to this view, encouraging student initiative respects learners' interests, needs, and individual capacities, while simultaneously fostering critical thinking and autonomous learning. Within the context of the present study, the uniformly high levels of student initiative across both instructional models suggest that such pedagogical principles are consistently implemented, regardless of variations in instructional organization or teaching staff.

Consequently, the lack of statistically significant differences should not be interpreted as an absence of pedagogical differentiation, but rather as evidence that student-centered principles are structurally embedded within the macro-didactic framework of physical education in the first educational period. This finding indicates that student initiative functions as a stable didactic component, shaped more by curricular alignment and shared pedagogical values than by the specific instructional model employed.

The components *Flow and realization* and *Educational effects* also do not show significant differences between groups ($p = 0.75$ and $p = 0.33$, respectively), which indicates that the quality of the teaching process and the perceived educational effects are relatively stable, regardless of variations in the teaching staff. The components *Flow and realization* and *Educational effects* also exhibited comparable mean values between groups, suggesting that perceived instructional quality and educational outcomes are not necessarily contingent upon the instructional model or teaching staff configuration**.** This finding resonates with research emphasizing that learning effectiveness in physical education depends primarily on task clarity, feedback quality, and practice conditions rather than on macro-organizational differences (Rink, 2013; Rink, 2020; Siedentop, Hastie, & van der Mars, 2011). The interpretation of these results is further strengthened by the perspective of Tasevska (2012), who underscores the importance of monitoring the flow and realization of the lesson as a core didactic responsibility of the teacher. According to this view, lesson realization is grounded in clearly defined content, themes, and modes of implementation, which serve as guiding frameworks for teachers throughout the instructional process. Importantly, Tasevska emphasizes that effective lesson realization requires teachers to anticipate various instructional situations and to prepare multiple pathways for achieving the intended learning objectives. This pedagogical flexibility allows teachers to respond to moments of reduced motivation, interest, or educational effect by offering alternative

forms of realizing the same instructional content. Within the context of the present study, the absence of statistically significant differences in *Flow and realization* may therefore reflect a shared level of teachers' didactic preparedness and professional competence in managing instructional dynamics. Such competence enables teachers to maintain continuity and coherence in the learning process, even when adjustments are required during lesson implementation. Similarly, the component *Educational effects* demonstrates stable outcomes across both groups, which aligns with Tasevska (2012) assertion that educational effects represent a complex synthesis of play, learning, and teaching. From this perspective, educational effects are not always immediately observable upon the completion of an activity; rather, their influence may emerge gradually through the stimulation of students' attitudes, behaviors, and dispositions. The teacher's pedagogical skill lies in defining these effects as expected outcomes of specific activities and in developing the capacity to recognize their manifestation over time.

Consequently, the results suggest that educational effects in physical education are deeply embedded within the instructional process itself, shaped by thoughtful lesson realization and reflective teaching practice rather than by structural differences between instructional models. The stability observed across groups indicates that these macro-didactic components function as consistent elements of quality instruction in the first educational period.

The *Compatibility* component is particularly indicative, where despite the minimal difference in mean values, a statistically significant difference in variances was observed ($F = 1.84$; $p = 0.00$). This points to greater heterogeneity in the responses in one of the groups, which may be due to different working styles, professional experience or individual pedagogical approaches of the teachers, and is an aspect that deserves deeper analysis in future research. An important observation emerges in the variable *Compatibility*, where a statistically significant difference in variances was detected despite the absence of mean differences. This result points to greater heterogeneity in teachers' interpretations of instructional alignment**,** which may reflect differences in professional experience, pedagogical beliefs, or levels of didactic competence. Similar findings have been reported by Casey and MacPhail (2018), who emphasize that variability in teachers' enactment of instructional models often occurs even within standardized curricular frameworks.The interpretation of the present results is further enriched by the perspective of Tasevska (2012), who underscores that instructional compatibility represents a foundational didactic principle. From this viewpoint, teaching content must always be aligned with students' prior knowledge, current abilities, needs, and interests, as well as with their age-related developmental characteristics and broader social context. Such alignment requires teachers to continuously adapt instructional content and methods, which naturally introduces variability in pedagogical practice. Within the context of the present study, the statistically significant variance in Compatibility may reflect differential levels of pedagogical sensitivity and adaptive competence among teachers, rather than inconsistencies in curricular design. Teachers who more systematically integrate students' prior experiences and developmental characteristics may demonstrate higher levels of instructional alignment, while others may rely more heavily on standardized content delivery.

Consequently, Compatibility emerges as a macro-didactic component that is particularly responsive to individual pedagogical interpretation and contextual judgment. The findings suggest that future research should move beyond mean-based comparisons and incorporate qualitative or mixed-method approaches to better understand how teachers operationalize compatibility in practice and how such differences influence instructional quality and learning outcomes.

For the components related to the roles of the student and the teacher (*The role of the student and The role of the teacher*), the results indicate highly consistent perceptions between the two groups, with no statistically significant differences ($p = 0.95$ and $p = 0.67$). This suggests that the basic structure of teaching roles is consistent and does not depend significantly on the teaching model. The components related to *The role of the student* and *The role of the teacher* show highly consistent mean values across groups, indicating a shared understanding of instructional roles. This supports the notion of role stability in early physical education**,** where teacher-directed instruction and structured student participation remain dominant regardless of methodological variations (Kirk, 2010). The interpretation of these findings is further strengthened by the perspective of Tasevska (2012), who emphasizes that the conceptualization of student and teacher roles represents a foundational component of both traditional and modern approaches to education. According to this view, the role of the student has long been positioned at the center of the teaching process, with an emphasis on student activity, engagement, and participation. Contemporary pedagogical approaches continue this trend while simultaneously redefining the role of the teacher. In this

context, Tasevska (2012) highlights the evolving role of the teacher as a mediator, active subject, motivator, facilitator, and democratic leader of the learning process. This modern understanding of the teacher's role complements student-centered pedagogy by fostering an instructional environment that encourages autonomy, engagement, and meaningful learning experiences. The absence of statistically significant differences in the present study suggests that these modern role conceptions are consistently integrated into instructional practice, regardless of the applied teaching model.

Consequently, the results indicate that the roles of both students and teachers function as stable macro-didactic elements, shaped by shared pedagogical values and curricular expectations rather than by specific instructional models. This stability reflects a balanced integration of traditional organizational structures and modern pedagogical principles, particularly in the first educational period.

In the domain of communication (*Language and speech, Verbal communication and Nonverbal communication*), although there is a tendency towards higher mean values in the second group for verbal communication ($M_2 = 4.25$), this difference does not reach statistical significance ($p = 0.09$). This may indicate subtle differences in communication style, but without sufficient empirical power to generalize conclusions. In the domain of communication (*Language and speech*, *Verbal communication*, and *Nonverbal communication*), the observed trends—particularly the near-significant difference in verbal communication—may suggest subtle pedagogical nuances. However, the lack of statistical significance implies that communication patterns are deeply embedded in professional teaching norms rather than model-specific strategies**,** a conclusion supported by research on teacher discourse in physical education (Chow et al., 2007). The findings of the present study are further contextualized by the perspective of Tasevska (2012), who highlights that language and speech represent a highly significant didactic segment of the teaching process. According to this view, the language used in teaching and within teaching content should be literate, clear, concise, understandable, and developmentally appropriate for students' age. Such linguistic clarity serves as a foundational condition for effective instruction and meaningful student engagement, particularly in early physical education. Similarly, Tasevska (2012) emphasizes the central role of verbal communication in facilitating interaction among all participants in the teaching process—between teacher and students, among students, and within student groups. Within the context of the present findings, the uniformly high mean values across both groups suggest that verbal communication is consistently recognized and applied as a core pedagogical tool, independent of instructional model variations. In addition, *Nonverbal communication* emerges as an equally important instructional component. As noted by Tasevska (2012), nonverbal communication in physical education is expressed through eye contact, facial expressions, gestures, confirmation of attention and engagement, as well as free and purposeful movement within the sports facility. These forms of communication are particularly salient in physical education settings, where instruction often relies on demonstration, spatial positioning, and embodied interaction.

Taken together, the results indicate that communication-related components function as stable macro-didactic elements, grounded in shared professional standards and pedagogical expectations. The lack of statistically significant differences suggests that both verbal and nonverbal communication are consistently integrated into instructional practice, reflecting a common pedagogical culture rather than differential implementation across instructional models.

The Climate and Atmosphere component recorded the highest mean values in both groups ($M_1 = 4.52$; $M_2 = 4.59$), indicating a positive and supportive teaching environment regardless of the teaching model and teaching staff. The highest mean values across both groups were recorded for *Climate and atmosphere*, highlighting a consistently positive learning environment. This finding aligns with motivational and psychosocial research emphasizing the central role of supportive climate in physical education, particularly in early schooling (Deci & Ryan, 2000; Ntoumanis, 2012). It further suggests that emotional and social dimensions of teaching are less sensitive to macro-didactic variations than to teachers' interpersonal competencies. The findings of the present study are further contextualized by the perspective of Tasevska (2012), who emphasizes that a positive instructional climate emerges when students perceive teaching content as meaningful and personally relevant. When students accept instructional content as their own and willingly engage in its realization, the teacher can expect positive indicators of engagement and learning. According to this view, a supportive climate and stimulating atmosphere are characterized by collaborative spirit, rich interaction, and mutual acceptance between teachers and students. Within the context of the present research, the high mean values for *Climate and atmosphere* suggest that such pedagogical conditions are consistently achieved, independent of macro-didactic variations. This indicates that

instructional climate is shaped more by teachers' interpersonal competencies, sensitivity to students' needs, and motivational strategies than by structural differences between instructional models.

Consequently, *Climate and atmosphere* emerges as a macro-didactic component that reflects shared pedagogical values and professional standards. Its stability across groups underscores the importance of affective and social dimensions of teaching as foundational elements of quality physical education in the first educational period.

Finally, *Technology* yielded the lowest mean scores in both groups, with no significant differences observed ($p = 0.45$). This result reflects broader international findings indicating limited integration of digital technologies in early physical education, often due to infrastructural constraints, curricular priorities, or perceptions of limited pedagogical relevance (Casey, Goodyear, & Armour, 2017; UNESCO, 2015).

The interpretation of these findings is further perceived by the perspective of Tasevska (2012), who acknowledges the increasing availability of technological resources in schools, such as computers, educational software, audiovisual materials, and multimedia content. Despite the recognized importance and potential applicability of such resources, Tasevska raises critical questions regarding the extent to which digital programs can authentically reflect the nature of physical education content within the school context. From this standpoint, the effectiveness of technology integration depends not on availability alone, but on its didactic alignment with instructional objectives and the specific characteristics of physical education.

Within the context of the present study, the uniformly low mean values for Technology may therefore reflect a cautious and selective approach to its use in physical education instruction. As suggested by Tasevska (2012), a selective and pedagogically justified integration of digital technologies—rather than extensive or indiscriminate use—may represent an acceptable and context-sensitive solution. Such an approach prioritizes instructional relevance and preserves the integrity of movement-based learning while allowing for targeted technological support.

Consequently, Technology emerges as a macro-didactic component characterized by limited but purposeful application. The findings indicate that future research should explore qualitative dimensions of technology use, focusing on how specific digital tools can enhance instructional clarity, motivation, and feedback in physical education without compromising its experiential and motor-oriented nature.

In summary, it states that the macro-didactic structure of physical education teaching is relatively stable and consistent, with no significant differences between the two teaching models in the characteristics of the teaching staff. These findings open up space for future research aimed at micro-didactic aspects, qualitative analyses, and a deeper consideration of the factors contributing to variability in certain components. Didactic-methodical elements express the quality of the process of active teaching that should lead every student to success. The question is what are the characteristics of efficient, quality teaching (Vilotievic, 1992). The application and significance of the macro didactic structure, i.e. their elements in the two applied models of teaching in Physical Education is of great or very great importance in the process of effective development teaching that would lead every student to success.

Conclusions

The discussion indicates that the macro-didactic structure of physical education teaching in the first educational period is characterized by a high level of stability and consistency, regardless of the applied instructional model and the teaching staff involved. The absence of statistically significant differences across almost all analyzed macro-didactic components suggests that key didactic–methodical elements—such as teacher and student initiative, lesson flow and realization, educational effects, teacher and student roles, communication, and classroom climate—are structurally embedded within the teaching process and shaped by shared curricular requirements and pedagogical standards.

At the same time, the statistically significant variability observed in the *Compatibility* component highlights that the alignment of instructional content with students' developmental characteristics, needs, and prior experiences remains sensitive to individual pedagogical interpretation and professional judgment. This variability does not undermine instructional quality; rather, it points to the importance of teachers' adaptive competence and suggests the need for further qualitative and micro-didactic analyses to better understand how such alignment is enacted in practice.

The consistently low level of technology integration across both instructional models further confirms that digital tools currently play a selective and context-dependent role in early physical education. This finding underscores the need for future research to explore pedagogically grounded approaches to

technology use that support learning objectives without compromising the movement-based nature of physical education.

Overall, the findings suggest that the quality and effectiveness of physical education teaching are primarily derived from a stable macro-didactic framework and the professional competence of teachers, rather than from structural differences between instructional models. These results emphasize the value of directing future research toward micro-didactic processes and contextual factors that contribute to effective, developmentally oriented teaching and to the educational success of all students.

References

Anastasovski, A. (1999). *Metodika na fizichko vospitanie*. Skopje: Prosvetno delo.

Angeloska Galevska, N. (1998). *Kvalitativni istrazhuvanja vo vospitanieto i obrazovanieto*. Bitola: Kiro Dandaro.

Bala, G. (2007). *Dizajniranje istraživanja u kineziologiji*. Novi Sad: Fakultet sporta i fizichkog vaspitanja.

Barakoska, A. (2013). *Opshta pedagogija*. Skopje: Filozofski fakultet.

Casey, A., Goodyear, V. A., & Armour, K. M. (2017). *Digital technologies and learning in physical education: Pedagogical cases*. Routledge. https://doi.org/10.4324/9781315670164

Casey, A., & MacPhail, A. (2018). Adopting a models-based approach to teaching physical education. *Physical Education and Sport Pedagogy, 23*(3), 294–310. https://doi.org/10.1080/17408989.2018.1429588

Child, D. (2004). *Psychology and the teacher*. London: Continuum.

Chow, J. Y., Davids, K., Button, C., & Renshaw, I. (2007). The role of nonlinear pedagogy in physical education. *Review of Educational Research, 77*(3), 251–278. https://doi.org/10.3102/003465430305615

Damovska, L. (2022). *Shto znachi da se studira na nastavnicki fakultet*. Skopje: Prosvetno delo.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Keramichiev, D. (1999). *Psihologija vo fizichkoto obrazovanie i sportot*. Skopje: Makedonska iskra.

Kirk, D. (2010). *Physical education futures*. Routledge.

Kirk, D., & Macdonald, D. (1998). Situated learning in physical education. *Journal of Teaching in Physical Education, 17*(3), 376–387. https://doi.org/10.1123/jtpe.17.3.376

Kozhuh, B., & Angeloska-Galevska, N. (2012). *Statistichka analiza na podatoci*. Skopje: Filozofski fakultet.

Kozhuh, B., & Angeloska-Galevska, N. (2012). *Uvod vo statistichka obrabotka*. Skopje: Filozofski fakultet.

Mosston, M., & Ashworth, S. (2008). *Teaching physical education* (1st online ed.). Pearson Education.

Ntoumanis, N. (2012). A self-determination theory perspective on motivation in sport and physical education. *Motivation in Sport and Exercise, 2*, 91–128.

Rink, J. E. (2013). *Teaching physical education for learning* (7th ed.). McGraw-Hill Education.

Rink, J. E. (2020). Teacher effectiveness in physical education. *Research Quarterly for Exercise and Sport, 91*(2), 273–280. https://doi.org/10.1080/02701367.2020.1746552

Siedentop, D., Hastie, P. A., & van der Mars, H. (2011). *Complete guide to sport education* (2nd ed.). Human Kinetics.

Tasevska, A. (2012). Didaktichko-metodsko modeliranje na igrovnata aktivnost vo ranata uchilishna vozrast. *Godishen zbornik na Filozofski fakultet, 65*, 18–30. Skopje: Filozofski fakultet.

UNESCO. (2015). *Quality physical education: Guidelines for policy-makers*. UNESCO Publishing.

Vilotijević, M. (1991). *Fizichko vaspitanje: Pedagoška akademija za obrazovanje uchitelja*. Beograd: Naučna knjiga.

Vilotijević, M. (1992). *Vrednovanje pedagoškog rada škole*. Beograd: Naučna knjiga.

Vilotijević, M. (1999). *Didaktika: Organizacija nastave*. Beograd: Naučna knjiga.

Vilotijević, M. (1999). *Didaktika: Predmet didaktike*. Beograd: Naučna knjiga.

Vilotijević, M. (2011). Sistemnost nastave kao makrodidaktichka inovacija. *Obrazovna tehnologija*, 2.