

Project-Based Learning as A Means of Developing Applicable Pedagogical Solutions for Health Upbringing among Primary School Age

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ABSTRACT: The present article presents the results of a pedagogical study conducted within university instruction with second year part time students enrolled in the programme “Preschool and Primary School Pedagogy” at Burgas State University 'Prof. Dr. Assen Zlatarov'. The study was carried out during the course Project-Based Learning and is focused on the development of educational solutions in the field of health upbringing, with a particular emphasis on nutrition in primary school age. Within the scope of the study, a survey was conducted with the assistance of Maya Todorova. An anonymous questionnaire was employed, comprising both closed and open-ended items aimed at identifying pupils' dietary habits and attitudes. Participation was voluntary, and the anonymity of respondents was fully ensured. The study was carried out among 60 primary school pupils in grades 3 and 4 within a non formal educational setting and was aligned with the requirements of Ordinance No. 13 on Civic, Health, Environmental and Intercultural Education. The findings indicate that the mere presence of knowledge regarding healthy nutrition does not constitute a sufficient condition for the formation of sustainable behaviour. The results reveal significant difficulties in transforming knowledge into sustainable behaviour, thereby delineating a clear educational problem. In this context, the students Siana Chobanova, Nikoleta Stoycheva, Eli Kirova, and Magdalena Dimitrova, through the application of Project-Based Learning and the technique “observation–association”, developed a digital educational platform designed to support informed choice and the formation of a responsible attitude towards nutrition. The platform is conceptualised as an educational tool intended to connect the pupil's everyday choices with processes of learning and self reflection. The results obtained indicate that Project-Based Learning within a university context can create conditions for the development of pedagogical thinking and for the design of applicable educational solutions aligned with the normative framework and with the developmental characteristics of primary school pupils.

KEYWORDS: Project-based learning; theory of upbringing; health education; nutrition education; primary school age; teacher education; pedagogical constructivism; digital educational platform

INTRODUCTION

Contemporary university preparation of future teachers ought to be oriented towards forms of thinking capable of recognising, analysing, and resolving real educational situations. Within this perspective, the university education of pedagogy students may be understood as a process through which the prospective teacher gradually acquires the capacity to discern the meaning underlying pupils' behaviour and to relate it to educational aims (Tiwari, J., Karthikeyan P., Guleria, K, 2025). In the field of health upbringing, this implies the capacity to translate normatively formulated requirements into the language of concrete situations, everyday choices, and real consequences for the pupil. Such an orientation towards active and meaningful learning corresponds to key principles of pedagogical constructivism, according to which knowledge is not transmitted directly but is constructed through the interaction between the learner, the content, and the specific social context. (Schunk, 2021). As emphasised by Jerome Bruner, learning is effective when the learner discovers meaning independently through participation and action rather than through the passive reception of information (Bruner, 1996). In this context, the ideas of John Dewey emphasise the importance of learning through experience and active engagement (Dewey, 1997). In turn, Lev Vygotsky emphasises the role of social interaction in the process of knowledge acquisition (Vygotsky, 1978). Project-Based Learning creates conditions for students to construct pedagogical knowledge through engagement with real and meaningful problems (Amiri, 2025). As noted by John W. Thomas and Joseph Krajcik, projects acquire educational value when they require learners to engage in analysis, decision making, and the creation of a product with practical orientation (Thomas, 2000); (Krajcik, J., & Blumenfeld, P, 2006). Within university teacher education, this implies that students are placed in the position of researchers and designers of educational solutions rather than as executors of pre defined instructions (Kaloyanova, 2021). It is precisely within this line of reasoning that the present study considers Project- Based Learning as a pedagogical framework in which future teachers of preschool and primary education develop an understanding of health

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upbringing as a process of forming attitudes and behaviour. The focus on nutrition in primary school age is not incidental, as this is a domain in which the pupil's choices are directly embedded in everyday life and offer opportunities for observation, reflection, and pedagogical engagement. In this way, university instruction becomes a space in which the theory of upbringing encounters practice and generates real, applicable, and educationally meaningful solutions. Positioned within this theoretical perspective, questions of upbringing cease to function as abstract categories and are transferred into concrete domains of school life, where pupils' behaviour is shaped on a daily basis and often without explicit awareness. It is precisely such domains that reveal, with particular clarity, the tension between normatively formulated educational aims and the actual practices of pupils. Among these, health upbringing occupies a distinctive place, as it manifests not only within the instructional setting but also through a sequence of everyday choices made by the pupil beyond direct pedagogical observation. These choices transform health from an abstract value into an educational field in which knowledge, habit, attitude, and personal responsibility intersect. For this reason, health upbringing provides an appropriate context for examining the educational potential of Project-Based Learning and for analysing the manner in which future teachers can translate the theoretical principles of upbringing into meaningful pedagogical action. Health upbringing in primary school age occupies a specific place within the theory of upbringing, as it is directed towards the formation of a sustainable attitude towards one's own health. It is precisely during this developmental period that educational influences have the greatest potential to become internalised as personal dispositions, since the pupil begins to recognise the relationship between everyday behaviour and individual well being. This understanding is clearly reflected in the Pre-school and School Education Act, where competences related to supporting sustainable development, as well as a healthy lifestyle and engagement in sport, are included among the key competences of general education. (GOV.BG, 2016). In this sense, a healthy lifestyle is understood as the outcome of purposeful educational influence encompassing nutrition, physical activity, and the pupil's personal responsibility (Bensley, R., Brookins-Fisher, J, 2023). As emphasised by Siyka Chavdarova-Kostova and her colleagues, upbringing is a process of forming attitudes rather than the mechanical acquisition of prescriptions, a position that is particularly relevant in the context of health upbringing (Chavdarova-Kostova, S., Delibaltova, V., Gospodinov, B, 2018). Practice in primary school, however, indicates that a discrepancy often exists between normatively established requirements and pupils' actual behaviour, particularly with regard to dietary choices and physical activity. This discrepancy should not be interpreted as a deficit on the part of the pupil, but rather as an educational situation requiring a pedagogical response. It is precisely here that the theory of upbringing provides the framework within which health upbringing is understood as a purposeful and long term process. This general legal framework finds its concrete pedagogical realisation in Ordinance No. 13 on Civic, Health, Environmental and Intercultural Education, which specifies the content and expected outcomes of health upbringing in the primary stage of education. Within this framework, health education is conceptualised as an integrative educational process directed towards the formation of sustainable attitudes and behavioural orientations rather than as the isolated acquisition of knowledge. Within the competence area "Nutrition" at the primary stage, Ordinance No. 13 on Civic, Health, Environmental and Intercultural Education formulates specific expectations of pupils related to recognising and classifying foods, understanding the significance of different types of food for health, composing a basic balanced daily menu, and becoming aware of the role of healthy nutrition for personal development. These requirements clearly indicate that nutrition is conceived as an educational field in which the pupil learns to make choices and to assume responsibility. It is particularly significant that Ordinance No. 13 on Civic, Health, Environmental and Intercultural Education places emphasis on the awareness and valuing of healthy nutrition, which presupposes educational work directed towards the formation of attitudes and dispositions. The distinction between appropriate and inappropriate foods, the observance of basic dietary rules, and the understanding of the importance of breakfast form part of a process of health upbringing that develops gradually and requires purposeful pedagogical engagement. The normative requirements established in the field of health upbringing clearly outline expectations for pupils in primary school age, yet they do not in themselves provide an answer to the question of how these expectations are translated into actual behaviour. It is precisely at this point that the space of pedagogical work emerges, in which the future teacher must recognise the educational situation and identify an appropriate mode of influence. Within university teacher education, this implies not the acquisition of ready made solutions, but the development of an independent capacity for pedagogical thinking.

METHODS

The starting point of the present study was the conduct of an inquiry among pupils in primary school age, directed towards the ways in which they understand and experience the theme of nutrition. Through questionnaire based interviewing, the study sought to address the extent to which pupils recognise different types of food, how they interpret their significance for health, and to what degree they are able to apply basic principles of healthy eating in their everyday lives. The results indicated that knowledge often remains at the level of recognition without being transformed into sustainable behaviour, particularly in situations involving actual food choice. This discrepancy between declared knowledge and real behaviour was not interpreted as a deficit on the part of the pupils, but rather as an educational situation requiring a pedagogical response. It was precisely this situation that became the focus of work within Project-Based Learning with pedagogy students. Rather than being assigned a pre formulated task, the students were

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encouraged to arrive at the problem independently through observation and reflection on the realities of educational practice. In this process, the technique “observation–association”, as described by Nadezhda Kaloyanova, was employed, enabling the students to attend closely to specific manifestations of pupils’ behaviour and to relate them to the broader educational context (Kaloyanova, 2021). Observation was not reduced to the mere recording of facts but became a means of identifying patterns of meaning and of formulating educational ideas. Work conducted in an environment different from the usual university or school setting further sharpened attention and supported more flexible associative thinking. Gradually, the students arrived at the need to develop an educational solution that would be aligned with the requirements of Ordinance No. 13 on Civic, Health, Environmental and Intercultural Education while remaining accessible to pupils in primary school age. The product developed is a direct outcome of this process and bears the marks of a considered pedagogical position rather than the formal fulfilment of normative requirements.

RESULTS

Within the framework of the study, a survey was conducted among 60 primary school pupils in a non formal setting with the aim of establishing the extent to which they are familiar with fundamental knowledge and skills in the domain of healthy nutrition as formulated in Ordinance No. 13 on Civic, Health, Environmental and Intercultural Education. The inquiry was directed towards the pupils’ actual level of orientation rather than towards the reproduction of curricular information. The analysis of the results indicates that a substantial proportion of pupils experience difficulties in classifying foods into different food groups. A total of 37 pupils, representing 61.7 per cent of the sample, report that they are unable to confidently identify the group to which various foods belong. This difficulty is indicative of a lack of stable orientation in the basic categories employed within health education. A similar tendency is observed in relation to pupils’ ability to explain the significance of different types of food for health. In this category, 43 pupils, or 71.7 per cent, state that they are unable to explain why certain foods are more beneficial than others and how they support development and physical well being. The responses suggest that food is frequently perceived primarily as a source of taste and satiety rather than as a factor related to health.

Indicator (Ordinance No. 13 – Nutrition)	Number of students with difficulties	Percentage (%)
Classifying foods into different food groups	37	61.7
Explaining the importance of different types of food for health	43	71.7
Preparing a basic balanced daily menu	46	76.7
Distinguishing suitable from unsuitable foods	34	56.7
Following basic rules for healthy eating (breakfast, regular meals, etc.)	41	68.3
Understanding and valuing the importance of healthy eating for personal development	38	63.3

Figure 1: Analysis of survey results on nutrition knowledge and skills among 60 primary school pupils
Source: Author’s empirical survey conducted in a non-formal educational setting, aligned with

Ordinance No. 13 on Civic, Health, Environmental and Intercultural Education (Republic of Bulgaria).

Particularly pronounced difficulties are observed in the composition of a basic balanced daily menu. A total of 46 pupils, representing 76.7 per cent, indicate that they do not know how to organise their daily eating patterns in a manner consistent with healthy practice. This includes both the selection of foods and their distribution over time, which is explicitly formulated as an expected outcome in Ordinance No. 13 on Civic, Health, Environmental and Intercultural Education. The data further reveal difficulties in distinguishing between appropriate and inappropriate foods. Within this category, 34 pupils, or 56.7 per cent, are unable to make a clear distinction between foods suitable for daily consumption and those that should be limited. This difficulty is particularly evident in relation to products with a highly attractive appearance, which further complicates the process of choice. In response to questions concerning the observance of basic principles of healthy eating, including the significance of breakfast and the regularity of meals, 41 pupils, or 68.3 per cent, report that they do not follow such principles in their everyday lives. The responses indicate a lack of established habits rather than a mere absence of information. Particularly revealing are the findings related to whether pupils recognise and value the significance of healthy nutrition for their own development. In this category, 38 pupils, representing 63.3 per cent, do not associate nutrition with their physical development, energy, and overall well being. This clearly delineates a deficit in the educational dimension of health education rather than solely in the cognitive domain. The overall analysis of the results demonstrates that, for the majority of the pupils studied, the expected skills and orientations in the area of “Nutrition” as set out in Ordinance No. 13 on Civic, Health, Environmental and Intercultural Education have not been sufficiently formed. The identified difficulties cannot be regarded as individual shortcomings, but rather as an educational problem requiring a purposeful pedagogical response. On the basis of these empirical findings, a digital educational platform was developed as a means

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of supporting informed choice, visualising dietary behaviour, and facilitating the gradual formation of a sustainable attitude towards healthy nutrition.

DISCUSSIONS

The final product developed within the framework of Project-Based Learning is a digital educational platform aimed at fostering a conscious attitude towards healthy nutrition among primary school pupils. Its structure and functionality are guided by the principle that the pupil should act as an active participant in the educational process, with personal dietary choices serving as a basis for learning, self assessment, and development. The platform operates through a mechanism of visual recognition and analysis of food, whereby the pupil captures in real time the food being consumed. The recorded image is processed by the system, which classifies the food into the appropriate food group and provides feedback aligned with the principles of healthy nutrition. In this way, the pupil receives immediate information related to a specific everyday choice. On the basis of the dietary selection made, the platform allocates points that reflect the degree of correspondence between the food consumed and the principles of healthy nutrition. Vegetables and fruits receive the highest number of points, followed by protein rich foods and whole grain products, while foods of low nutritional value do not generate points. This point based mechanism does not perform a punitive function, but serves as a means of orientation and the gradual formation of preferences grounded in understanding rather than prohibition. The accumulated points have a clear educational purpose, as they enable the pupil to unlock video lessons of an explanatory and instructional nature. Access to these video lessons is not automatic but is linked to the pupil's active participation, as the free instructional content becomes available only upon the accumulation of a defined number of points within the individual profile. In this way, learning is experienced as a consequence of one's own actions rather than as externally imposed content. The video materials extend knowledge of food groups, the significance of balanced nutrition, and the relationship between food, energy, and health. A particularly important educational element of the platform lies in the possibility for the pupil to monitor accumulated points and personal progress. This feature may create conditions for the formation of basic skills of self reflection and self regulation, through which the pupil begins to comprehend the relationship between choice, consequence, and knowledge. The platform does not replace the role of the teacher but functions as an educational mediator that supports pedagogical influence and renders it more accessible and closely connected to the pupil's everyday experience. In this sense, the final product should not be regarded merely as a technological application, but as an educational solution developed in accordance with the requirements of Ordinance No. 13 on Civic, Health, Environmental and Intercultural Education, and more specifically with the objectives of health education within primary school age. Through the integration of observation, action, and reflection, it can create conditions for the gradual formation of a responsible attitude towards nutrition as an integral part of a healthy lifestyle. It represents the outcome of purposeful pedagogical thinking and demonstrates how Project-Based Learning within a university context can lead to practically applicable and educationally meaningful solutions.

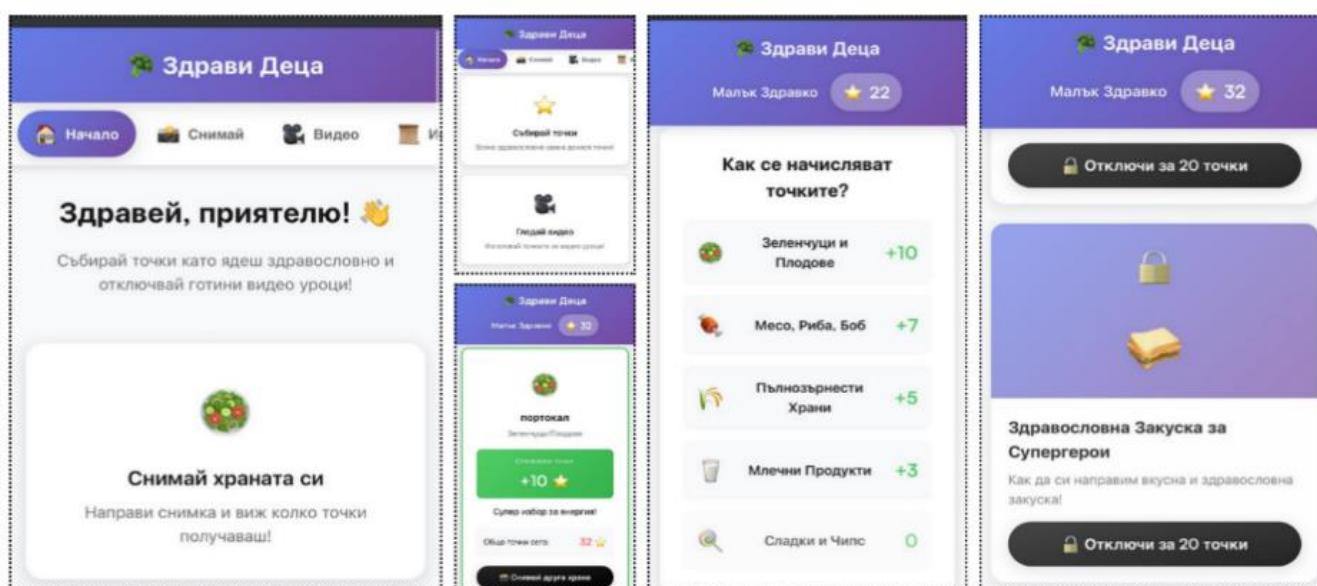


Figure 2: Visualization of the digital educational platform

Source: Author's project-based learning output developed by pedagogy students within the university course framework.

CONCLUSIONS

The present study supports the understanding that health upbringing in primary school age cannot be regarded as an automatic

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outcome of normative prescriptions or the acquisition of information. The empirical findings clearly indicate that a substantial discrepancy exists between the expectations formulated in Ordinance No. 13 on Civic, Health, Environmental and Intercultural Education and pupils' actual dietary behaviour, a discrepancy that should be interpreted as an educational problem rather than an individual deficit. This divergence highlights the need for pedagogical solutions capable of creating conditions for informed choice, the formation of attitudes, and the gradual development of sustainable behaviour. Within this context, Project-Based Learning in the university preparation of future teachers emerges as a promising pedagogical framework through which the theory of upbringing acquires a practical dimension. Through engagement with a real educational situation, students of preschool and primary education develop the capacity to analyse concrete educational contexts, to formulate educational tasks, and to seek solutions aligned both with the normative framework and with the developmental characteristics of pupils. The digital educational platform developed within this process demonstrates how Project-Based Learning can lead to the creation of an applicable educational tool that supports the connection between knowledge, action, and reflection. Through the visualisation of dietary behaviour, the provision of feedback, and the stimulation of self reflection, the platform can create conditions for the formation of a responsible attitude towards nutrition as part of a broader healthy lifestyle. The study reveals the potential of Project-Based Learning to prepare future teachers who are capable of translating the principles of upbringing into meaningful and sustainable pedagogical action within real school practice.

REFERENCES:

- 1) Amiri, S. (2025). Project-based learning pedagogy: Bridging theory and practice for real-world impact. *International Journal of Research and Innovation in Social Science*, 9, 3810–3831.
<https://doi.org/10.47772/IJRISS.2025.903SEDU0274>.
- 2) Bensley, R., Brookins-Fisher, J. (2023). *Community and Public Health Education Methods: A Practical Guide*. Burlington: Jones & Bartlett Learning. ISBN-13: 978-1284295405.
- 3) Bruner, J. (1996). *The Culture of Education*. Cambridge, Massachusetts: Harvard University Press. ISBN-13: 978-0674179523.
- 4) Chavdarova-Kostova, S., Delibaltova, V., Gospodinov, B. (2018). *Pedagogika*. Sofia: UI Sv. Kliment Ohridski. ISBN: 9789540743288, 2018. .
- 5) Dewey, J. (1997). *Experience And Education*. Free Press. ISBN-13: 978-0684838281.
- 6) GOV.BG, R. o. (2016). Pre-school and School Education Act. State Gazette, No. 79, in force from August 1, 2016. Sofia: Ministry of Education and Science. (Act, Art. 77, para. 1, item 9).
- 7) Kaloyanova, N. (2021). CREATIVE TECHNIQUES IN PROJECT-BASED LEARNING . MANAGEMENT AND EDUCATION VOL. 17 (3) , 141-147.
- 8) Krajcik, J., & Blumenfeld, P. (2006). *Project-Based Learning*. New York: Cambridge : University Press.
- 9) Schunk, D. (2021). *Learning Theories: An Educational Perspective* 8th Edition. London: Pearson, ISBN-13: 9780137413294.
- 10) Thomas, J. (2000). A review of research on project-based learning. San Rafael, CA: Autodesk Foundation.
- 11) Tiwari, J., Karthikeyan P., Guleria, K. (2025). *Project-Based Learning: Engaging Students Through Real-World Challenges* . Crosby Books (an imprint of EZ Education). ISBN 978-93-91654-63-4.
- 12) Vygotsky, L. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, Massachusetts: Harvard University Press. ISBN-13: 978-0674576292.