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PEDAGOGICAL FOUNDATIONS OF THE APPLICATION OF PROBLEM-BASED LEARNING TECHNOLOGIES IN LITERARY EDUCATION AT PRIMARY SCHOOL

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Abstract. This article examines the pedagogical foundations of the application of problem-based learning technologies in literary education at primary school. The study proceeds from the contradiction between the competence-oriented aims declared in contemporary curricula and the predominantly reproductive practice of work with literary texts in the primary grades. The author substantiates a four-component model of the pedagogical foundations of problem-based literary instruction, comprising the gnoseological, psychological, didactic and technological components, and elaborates a typology of five kinds of problem situation applicable to the primary literature lesson, together with three graded levels of problematicity calibrated to the cognitive capacities of pupils aged seven to ten. The canonical polemic between P. Kirschner, J. Sweller and R. Clark on the one hand and C. Hmelo-Silver, R. Duncan and C. Chinn on the other concerning the effectiveness of minimally guided instruction is subjected to critical examination. The findings demonstrate that the effectiveness of problem-based technology in primary literary education depends not upon the degree of pupil independence as such but upon the precision with which pedagogical support is calibrated.

Keywords: problem-based learning, pedagogical technology, primary education, literary education, problem situation, reading competence, zone of proximal development, scaffolding, levels of problematicity, interpretation of a literary text, cognitive load, competence-based approach.

INTRODUCTION

The transformation of the aims of general education that has taken place over recent decades has decisively altered the status of the primary stage of schooling. Where the primary grades were once understood principally as the site at which the instrumental skills of reading, writing and calculation are acquired, contemporary educational theory assigns them a far more demanding function: the formation of the foundations of the key competences upon which all subsequent learning depends. Within this reconceived framework literary education occupies a position of particular importance, since it is here that the child is first constituted not merely as a decoder of written signs but as a reader, that is, as a subject capable of entering into a meaningful relation with a text, of forming an interpretation of it and of taking a position with respect to what has been read.

This reorientation, however, has encountered a persistent methodological difficulty. The literary text is by its very nature polysemic: it admits of several defensible interpretations, it communicates through implication as much as through statement, and its meaning is completed only in the act of reading. Traditional primary methodology, by contrast, has tended to organise work with the text around the extraction of a single predetermined meaning, so that the pupil's task is reduced to the reproduction of a conclusion already formulated by the teacher or the textbook. The consequence is a systematic mismatch between the nature of the object studied and the manner of its study, and it is this mismatch that generates the familiar phenomenon of pupils who read fluently yet remain unable to explain why a character acted as he did or what the text as a whole is about.

Problem-based learning offers a theoretically grounded response to this difficulty. The tradition derives from the pragmatist conception of thinking as an activity initiated by a felt difficulty, elaborated in the work of J. Dewey, and was subsequently developed into a systematic didactic theory in which the central category is that of the problem situation, understood as a state of intellectual

difficulty arising when the pupil's existing knowledge proves insufficient for the task at hand. The pedagogical value of such a situation lies in the fact that it generates a cognitive need: the pupil does not receive a question imposed from without but arrives at a question of his own, and the ensuing search acquires the character of genuine inquiry rather than of compliance.

The literary text is an unusually favourable site for the construction of such situations. The gaps and silences of narrative, the discrepancy between a character's stated motive and his actual conduct, the ambiguity of a title, the possibility of an alternative ending and the divergence of pupils' own emotional responses all constitute natural points of resistance at which a problem situation may be generated without artificial contrivance. In this respect literary education differs favourably from those subjects in which problem situations must be constructed by the teacher against the grain of the material; in the literature lesson the material itself is problematic, and the task of the teacher consists in rendering that inherent problematicity perceptible to the child.

The age characteristics of pupils in the primary grades nevertheless impose substantial constraints upon the realisation of this potential. Children between the ages of seven and ten operate predominantly with concrete rather than formal categories; their capacity to hold several competing hypotheses simultaneously is limited, and their working memory is readily overloaded. It follows that a problem situation intended for this age must be anchored perceptually and emotionally, must be formulated in terms that refer to observable events rather than to abstract generalisations, and must be supported by a structure of assistance that prevents the productive difficulty from becoming an unproductive impasse. The Vygotskian conception of the zone of proximal development supplies the theoretical measure here: a problem situation is pedagogically appropriate precisely when its resolution lies beyond the child's independent capacity yet within his capacity when supported.

A further consideration concerns the distinction between a problem method and a problem-based technology. The occasional use of a provocative question does not constitute a technology; technologisation presupposes diagnostically formulated aims, a reproducible sequence of stages, a defined system of pupil and teacher actions at each stage, and criteria permitting the result to be assessed. The absence of this distinction in practice leads to a characteristic deformation, in which isolated problem questions are inserted into an otherwise reproductive lesson and the underlying structure of instruction remains unchanged. The elaboration of the pedagogical foundations of problem-based literary education therefore requires that the technological dimension be treated as constitutive rather than supplementary.

In the Republic of Uzbekistan the relevance of these questions has been heightened by the reform of general secondary education and by the transition to competence-oriented state educational standards, which define the expected results of primary schooling in terms of what the pupil is able to do with a text rather than in terms of what he is able to reproduce from it. The participation of the country in international comparative assessments of reading literacy has further sharpened attention to the quality of comprehension as distinct from the fluency of decoding. These developments have created favourable institutional conditions for problem-based technologies, yet the gap between the declared aims and the prevailing classroom practice remains considerable.

The scholarly problem of the present study arises from two intersecting contradictions. The first obtains between the competence-oriented aims of contemporary primary literary education and the reproductive character of the methods by which those aims are in practice pursued. The second, internal to the theory of problem-based learning itself, obtains between the requirement that the pupil construct meaning independently and the empirically documented vulnerability of young learners to cognitive overload when instructional guidance is withdrawn. The resolution of the second contradiction is a precondition for the resolution of the first, since a problem-based technology that disregards the limits of the primary-age learner will fail precisely where it is most needed.

The aim of the article is to substantiate the pedagogical foundations of the application of problem-based learning technologies in literary education at primary school. The following tasks were accordingly defined: to establish the components constituting these foundations; to elaborate a typology of problem situations realisable upon literary material in the primary grades; to determine the levels of problematicity corresponding to the age capacities of pupils; and to identify the conditions and risks governing the effective application of the technology.

The scholarly novelty of the study consists in the presentation of the pedagogical foundations of problem-based literary instruction as an integral four-component model, comprising a gnoseological component derived from the interpretive nature of literary knowledge, a psychological component derived from the age characteristics of the primary learner, a didactic component defining the structure and levels of the problem situation, and a technological component securing reproducibility and diagnosability. The results obtained may be drawn upon in the preparation and retraining of primary school teachers, in the design of methodological guidance for literary reading, and in further research into the application of problem-based technologies at the primary stage.

LITERATURE REVIEW

Within Uzbek pedagogical scholarship the theoretical foundation of the present study is supplied above all by the work of N. Saidahmedov devoted to contemporary pedagogical technologies. The scholar's principal contribution consists in the rigorous delimitation of the concept of pedagogical technology from the broader and looser notion of teaching method: a technology, in his account, presupposes diagnostically formulated aims, a reproducible sequence of procedures, the guaranteed attainability of the projected result and the possibility of its objective assessment. This delimitation is of direct methodological consequence for the present inquiry, since it establishes the criteria by which the occasional use of problem questions may be distinguished from a genuine problem-based technology. N. Saidahmedov's insistence that technologisation entails the specification of the actions of both participants at each stage of the process likewise underlies the structural description of the primary literature lesson advanced below.

The second pillar of the theoretical framework is provided by the research of Q. Yo'ldoshev in the methodology of teaching literature. Elaborating the principles of work with the literary text, the scholar consistently opposes the practice of communicating ready-made interpretations to pupils and argues that the aesthetic and educative effect of literature is destroyed at the moment when the text is converted into an illustration of a predetermined thesis. Of particular significance is his emphasis upon the emotional and evaluative response of the reader as a constitutive rather than an incidental component of literary understanding, and upon the necessity of allowing the pupil's own reading to be articulated before any authoritative interpretation is introduced. This position supplies the immediate methodological warrant for organising the primary literature lesson around problem situations, since a problem situation is precisely a device for eliciting and legitimating the pupil's independent reading.

The broader institutional and value dimensions of the problem are illuminated by contemporary research on education and the formation of worldview. In the work of S. Ergashbaev on the development of the spiritual worldview of young people through the system of continuous education, it is substantiated that the formation of value orientations is the outcome of a sustained pedagogical process rather than of isolated influences, a thesis of direct relevance to the cumulative logic of problem-based instruction. In a further study by the same author concerning the elevation of the spiritual and philosophical worldview of young people through continuous education, the cultivation of independent critical reflection is singled out as the central function of the educational system. The study by M.M. Mirzaolimjon og'li and E. Shohbozbek, devoted to the educational policy of New Uzbekistan and to new models of universities, discloses the institutional context within which the contemporary teacher is prepared.

Within foreign scholarship the problem has been framed through several competing paradigms. J. Dewey established the foundational conception of thinking as an activity initiated by a felt difficulty and of education as the organisation of genuine inquiry. L.S. Vygotsky supplied the decisive psychological criterion in the conception of the zone of proximal development, which defines the productive difficulty as that which the learner cannot overcome alone but can overcome with assistance. J. Bruner developed the corresponding didactic programme of discovery learning and the principle of the spiral organisation of the curriculum. Against this tradition P. Kirschner, J. Sweller and R. Clark advanced a systematic critique grounded in the theory of cognitive load, arguing that minimally guided instruction is inefficient for learners who lack the prior knowledge required to direct their own search. C. Hmelo-Silver, R. Duncan and C. Chinn replied that this critique misrepresents problem-based learning, which in its developed forms incorporates extensive scaffolding. Comparative examination of Uzbek and foreign scholarship reveals that the former has elaborated the criteria of technologisation and the principles of literary interpretation while the latter has established the psychological limits of independent inquiry; the gap that remains, and which the present article addresses, is the absence of a model integrating these two bodies of insight for the specific conditions of primary literary education.

RESEARCH METHODOLOGY

The methodological foundation of the present study is constituted by the systemic approach to pedagogical phenomena, which made it possible to consider problem-based literary instruction not as an aggregate of separate techniques but as an integral system possessing its own aims, content, procedural structure and criteria of result; within this general framework the activity approach performed the leading function, since it permitted the treatment of reading competence as a formation arising only within the learner's own activity and therefore requiring instructional designs that place the pupil in the position of an acting subject rather than a recipient. The competence approach was applied in formulating the projected results of instruction in terms of demonstrable capacities rather than of reproduced content, and in establishing the correspondence between types of problem situation and the components of competence they are intended to form. The theoretical analysis of scholarly and methodological literature was employed in reconstructing the conceptual history of problem-based learning and in delimiting the concept of pedagogical technology from adjacent notions. The comparative-pedagogical method served to juxtapose the approaches elaborated within Uzbek and foreign scholarship and to identify the points at which they converge and diverge. The age-psychological approach was applied in correlating the demands of the problem situation with the cognitive capacities characteristic of pupils between the ages of seven and ten, and in particular with the limits of working memory and the predominance of concrete over formal operations. The hermeneutic method was employed in analysing the literary texts of the primary reading curriculum and in identifying within them the points of semantic resistance at which problem situations may be generated without artificial contrivance. Content analysis was applied to curricula, state educational standards and reading textbooks in order to establish the proportion of reproductive and productive tasks and to identify the structural positions at which problem tasks might be introduced. Pedagogical observation of literature lessons and the structured analysis of lesson records were used to establish the prevailing patterns of questioning and the typical forms of pupil response. Questioning and interviewing of teachers served to determine the level of their readiness to apply problem-based technologies and the difficulties they encounter. The method of expert assessment was applied in evaluating the proposed typology of problem situations and the criteria of their appropriateness. Pedagogical modelling yielded the four-component model of the pedagogical foundations and the staged structure of the problem-based literature lesson. The methods of typology and classification produced the ordered inventory of problem situations and the graded scale of levels of problematicity.

The method of pedagogical design was applied in elaborating the concrete procedural algorithms corresponding to each level. Elements of the pedagogical experiment, organised in ascertaining, formative and control stages, were used to verify the proposed model under classroom conditions, and methods of statistical processing were applied to the resulting data in order to establish the significance of observed differences. General scientific procedures including analysis and synthesis, induction and deduction, abstraction, generalisation and analogy were applied consistently at every stage of the research and served to secure the logical grounding, the correspondence to empirical evidence and the internal coherence of the conclusions.

RESULTS

The study substantiated a four-component model of the pedagogical foundations of problem-based literary instruction at the primary stage. The gnoseological component derives from the interpretive nature of literary knowledge and establishes that the aim of the literature lesson is not the transmission of a single correct reading but the formation of the capacity to construct and justify a reading, from which follows the admissibility and indeed the necessity of divergent pupil responses. The psychological component derives from the age characteristics of the primary learner and establishes the conditions under which difficulty remains productive: the problem must be anchored in observable events, formulated in concrete terms, and supported so that its resolution lies within the zone of proximal development. The didactic component defines the internal structure of the problem situation, comprising the presentation of material containing a contradiction, the pupil's recognition of the insufficiency of existing knowledge, the formulation of the question, the advancing of hypotheses, their verification against the text and the formulation of a justified conclusion. The technological component secures reproducibility by specifying the actions of teacher and pupils at each stage together with diagnostic criteria permitting the result to be assessed. A second result consists in the elaboration of a typology of five kinds of problem situation realisable upon primary literary material: the situation of normative contradiction, in which a character's conduct diverges from an accepted moral expectation; the situation of textual incompleteness, in which the narrative withholds information that the reader must supply by inference; the situation of alternative, in which the pupil is required to consider how events might have developed had a character chosen otherwise; the situation of interpretive divergence, in which the differing readings advanced by pupils themselves become the object of examination; and the situation of nominative discrepancy, in which the relation between the title of a work and its content is rendered problematic. A third result consists in the establishment of three graded levels of problematicity: at the first level the teacher formulates the problem and demonstrates the reasoning aloud, the pupil following the model; at the second level the teacher formulates the problem while the pupils advance and verify hypotheses under structured guidance; and at the third level the pupils themselves detect the contradiction and formulate the question. The analysis established that progression through these levels should be governed by the pupils' accumulated experience of textual reasoning rather than by calendar age, and that premature transition to the third level produces the characteristic outcome of superficial guessing unsupported by textual evidence. A fourth result concerns the decisive variable of effectiveness: the comparison of observed lessons indicated that outcomes correlate not with the degree of pupil independence as such but with the precision of the instructional support provided, which confirms the theoretical position that problem-based technology and structured guidance are complementary rather than opposed. A fifth result consists in the identification of the principal risks attending the application of the technology, namely the substitution of genuine problems by pseudo-problems whose answers are contained in the question, the disproportionate expenditure of lesson time upon a single situation, the emotional overloading of pupils by morally weighted material, and the reduction of the literary work to an instrument of cognitive exercise at the cost of its aesthetic effect.

DISCUSSION

The results obtained require to be situated within the most consequential methodological controversy in contemporary research on problem-based instruction, namely the exchange initiated by P. Kirschner, J. Sweller and R. Clark and answered by C. Hmelo-Silver, R. Duncan and C. Chinn. In their widely cited analysis, Kirschner and his colleagues argue that instructional approaches which provide minimal guidance, including discovery, inquiry and problem-based learning, are less effective than fully guided instruction, and that this inferiority is not accidental but follows from the architecture of human cognition. Their argument rests upon the theory of cognitive load: since working memory is severely limited when processing novel information, a learner who lacks the relevant schemas in long-term memory and is nevertheless required to direct his own search will expend his limited processing capacity upon the search itself rather than upon the construction of the schemas that constitute learning. On this account the apparent authenticity of unguided inquiry is purchased at the cost of its instructional efficiency, and the approach is least suitable precisely for novices.

Hmelo-Silver, Duncan and Chinn reply that this critique rests upon a mischaracterisation of its target. Problem-based and inquiry learning in their developed forms, they contend, are not minimally guided at all but are among the most heavily scaffolded approaches in existence: the problem is carefully structured, the teacher models reasoning, the sequence of inquiry is supported by tools and prompts, and support is progressively withdrawn as competence increases. The disagreement, on their account, concerns not whether guidance is necessary but at what points and in what form it is supplied — whether it precedes the learner's engagement with the problem or accompanies it. They further argue that the outcomes at issue extend beyond the acquisition of schemas to include the capacity to apply knowledge in unfamiliar contexts and the disposition to engage in inquiry, which the experimental designs favoured by their opponents are not constructed to detect.

The philosophical substance of this disagreement lies in the divergent conceptions of the learner that the two positions presuppose. For Kirschner and his colleagues the learner is primarily a processor of information whose limitations must be respected by instructional design; for Hmelo-Silver and her colleagues the learner is primarily an agent whose disposition and capacity for inquiry are themselves outcomes of instruction and cannot be formed by transmission. Two further positions bear upon the controversy. The Vygotskian conception of the zone of proximal development anticipates the terms of the resolution by locating productive learning precisely in the interval between independent and assisted performance, and thereby renders the opposition between independence and guidance conceptually unstable. J. Dewey's account of inquiry, for its part, insists that the initiating difficulty must be genuinely felt by the learner rather than announced by the teacher, which sets a limit to how far guidance may extend without destroying the phenomenon it is meant to support.

The conditions of primary literary education intensify both sets of concerns simultaneously. The cognitive-load objection applies with particular force to pupils aged seven to ten, whose working memory is least capacious and whose store of relevant prior knowledge is smallest; yet the counter-argument applies with equal force, since the disposition to interrogate a text rather than merely to decode it is formed at this stage or not at all. The model advanced in the present article resolves the tension by treating the level of problematicity as the adjustable variable: at the first level guidance is maximal and the problem is used to demonstrate a mode of reasoning, at the second it is structured and distributed, at the third it is largely withdrawn. On this construction the two positions are not competing answers to a single question but descriptions of different points upon a single developmental trajectory, and the pedagogical task consists in locating each class of pupils correctly upon that trajectory rather than in choosing between the approaches in the abstract.

CONCLUSION

The study has shown that the effective application of problem-based learning technologies in primary literary education presupposes a set of pedagogical foundations that cannot be reduced to methodological technique alone. These foundations constitute an integral system in which the interpretive nature of literary knowledge, the cognitive characteristics of the primary learner, the internal structure of the problem situation and the requirements of technologisation are mutually conditioning.

First, the gnoseological foundation establishes that divergence of pupil interpretation is not an obstacle to be eliminated but the very material upon which literary competence is built, from which it follows that the aim of the lesson must be reformulated from the transmission of a reading to the formation of the capacity to justify one. Second, the psychological foundation establishes the limits within which difficulty remains productive, and identifies the zone of proximal development as the operative criterion of the appropriateness of a problem situation.

Third, five types of problem situation were distinguished as realisable upon primary literary material — normative contradiction, textual incompleteness, alternative, interpretive divergence and nominative discrepancy — together with three graded levels of problematicity whose sequence should be governed by accumulated experience of textual reasoning rather than by calendar age. Fourth, the decisive variable of effectiveness proved to be not the degree of pupil independence but the precision with which instructional support is calibrated, which indicates that problem-based technology and structured guidance stand in a relation of complementarity.

Fifth, the principal risks attending the application of the technology were identified as the substitution of genuine problems by pseudo-problems, the disproportionate expenditure of lesson time, the emotional overloading of pupils and the reduction of the literary work to an instrument of cognitive exercise. These conclusions may be drawn upon in the preparation and retraining of primary school teachers, in the design of methodological guidance for literary reading and in further research. The most promising direction for subsequent inquiry may be identified as the experimental verification of the proposed scale of levels upon an expanded sample.

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