# AI-BASED HOMEWORK ASSISTANCE AS A SERVICE INNOVATION IN PRIVATE EDUCATION: OPPORTUNITIES, PERCEIVED VALUE AND EXPECTED LEARNING OUTCOMES

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**Abstract**

Homework remains one of the areas in which the distance between pedagogical intention and the family's everyday experience becomes most visible. Teachers generally see homework as necessary for consolidating knowledge, students often associate it with fatigue, blockage and monotony, while parents are frequently pushed into the difficult role of educational supporter, even when they do not have the time, patience or methodological tools required. In this context, the paper analyses the opportunity of using an AI-based homework assistant in private education, starting from the concept of Profesorul.ai/Virtual Teacher, developed as a digital educational solution and examined through a pilot study carried out in a private educational training setting. The research is designed as an exploratory pilot study conducted over four weeks, between February and March 2025, during an active school period. The study uses a simulated pilot dataset built on the beta-testing structure of Profesorul.ai and on the profile of the target users: 120 parents of students in grades IV-VIII, 80 students and 10 teachers/tutors. The analysis focuses on three dimensions: the opportunity of using the AI assistant, the perceived value for parents and students, and the expected learning outcomes. The findings indicate strong interest in a curriculum-controlled digital support tool, available outside regular teaching hours and designed to guide students without giving them direct answers. The contribution of the paper lies in proposing an integrated perspective on AI-based homework assistance as a service innovation in private education, at the intersection of artificial intelligence, educational management, educational marketing and customer relationship management.

**Keywords:** artificial intelligence, homework assistance, private education, service innovation, perceived value, educational CRM, student autonomy, expected learning outcomes

**JEL Classification:** M31, M15, I21, I23, O33

## 1. Introduction

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The digital transformation of education is no longer only a matter of infrastructure or access to online platforms. In recent years, especially after the rapid diffusion of generative artificial intelligence tools, the debate has shifted towards the quality of educational support offered to students beyond direct interaction with the teacher. Intelligent tutoring systems and conversational applications are examined as resources for personalising learning, but also as sources of pedagogical, ethical and operational risks [1], [2]. At the same time, private education providers are increasingly evaluated not only for the quality of teaching, but also for their ability to provide continuity, flexibility and timely responses to the real needs of students and parents.

In private education, homework is not merely a pedagogical task placed between two meetings with the teacher. It becomes a visible part of the service experience: the parent observes whether the child understands, gets stuck, gives up, spends too much time on the task, or experiences tension at home. This creates a direct connection with educational marketing and customer relationship management. The continuity of educational support influences trust, satisfaction and parents' willingness to recommend the service.

The concept of Profesorul.ai/Virtual Teacher is relevant to this discussion because it proposes an AI assistant limited to the school curriculum, focused in the pilot stage on Mathematics and Romanian Language, with text, voice and image interaction. The tool is designed to support homework completion and test preparation through explanations, suggestions, examples and encouragement, without providing direct answers. This boundary is not a technical detail, but a pedagogical condition: the purpose is not to automate homework, but to keep the student active in the process of solving it.

The paper starts from the following assumption: an AI-based homework assistant can become a service innovation in private education only if it responds at the same time to an educational need, a relational expectation and an ethical condition. In other words, the tool must be useful for the student, acceptable for the parent and credible for the teacher. Therefore, the analysis does not stop at technological usefulness, but examines the role of the tool in the relationship between the educational provider, the student and the family.

The research problem is built around the paradox of homework. On the one hand, homework consolidates knowledge, creates work routines and develops responsibility. On the other hand, when the student does not understand the task or does not receive support in time, the same homework may become a source of frustration, postponement and temporary abandonment. For parents, this situation brings pressure, time consumption and, sometimes, conflict. For a private education provider, this difficulty is not secondary, because it can influence the perceived quality of the entire service.

The general objective of the paper is to analyse the extent to which an AI-based homework assistant, designed to provide step-by-step guidance, emotional support and explanations adapted to the student's level, can be perceived as a valuable service innovation in private education. The study examines opportunity, perceived value and expected learning outcomes, using a simulated pilot dataset built on the basis of a private educational training setting and the beta-testing structure of Profesorul.ai.

From a theoretical point of view, the paper is positioned at the intersection of research on artificial intelligence in education, service innovation, perceived value and customer relationship management. From an applied perspective, it proposes an interpretative framework for private education providers that aim to integrate AI tools without weakening the teacher's role and without encouraging students' dependence on automatic answers.

## 2. Literature review and theoretical framework

### 2.1 Artificial intelligence in education and intelligent tutoring

Recent literature on artificial intelligence in education highlights its capacity to provide rapid feedback, adapt to students' pace and support repetitive or individual tasks [3], [4]. Intelligent tutoring systems have long aimed to approximate some of the benefits of one-to-one interaction: adapted explanations, gradual exercises and immediate feedback. Generative models add a new dimension through natural conversation and the ability to reformulate the same explanation in different ways [5].

However, the adoption of AI in education cannot be treated as a simple technological upgrade. The literature points to risks related to inaccurate answers, excessive dependence, reduced cognitive effort, data privacy and insufficient pedagogical control [2], [6]. For this reason, international recommendations emphasise transparency, human oversight, safety and the alignment of AI tools with clear educational objectives [1], [7].

In pre-university education, these precautions are particularly important. An AI-based homework assistant should not function as a generator of final solutions, but as a support mechanism that provides hints, explains steps and encourages trying. In this logic, the student remains the author of the solution, while technology plays an accompanying rather than substitutive role.

### 2.2 Homework, learning continuity and student persistence

Homework has a recognised pedagogical function: consolidating knowledge, practising autonomy, organising individual work and preparing for assessment. In practice, however, its effectiveness depends on the support available when the student encounters difficulties. A misunderstood task or a wrongly started exercise can quickly turn a useful activity into a demotivating experience. From the student's perspective, the

problem is not always the amount of homework, but the moment of blockage and the lack of immediate feedback.

The working materials of Profesorul.ai describe this tension as a homework paradox: teachers consider homework essential for consolidation, students often perceive it as tiring or monotonous, and parents feel the pressure to intervene. Such intervention is not always simple. Many parents lack the time, emotional availability or methodical approach needed to explain a task without increasing tension. Homework thus becomes not only a school assignment, but also a test of family communication.

Learning continuity is therefore relevant for private educational services. Support received during a tutoring session may lose part of its effectiveness if the student is left alone with homework in the following days. An AI tool available when needed can reduce this discontinuity. Its value, however, is not measured only by the speed of response, but by its ability to keep the student engaged, clarify the steps and strengthen the feeling that continuation is possible.

### 2.3 Service innovation, perceived value and educational CRM

Service innovation does not only mean introducing a new technology, but reconfiguring processes and interactions through which beneficiaries perceive additional value. In private education, this value includes teaching, but it is not limited to it. Accessibility of support, trust, safety, communication and the feeling that the provider understands the practical difficulties of the family all matter. An AI-based homework assistant may therefore be analysed as an extension of the educational service, because it moves part of the support outside the formal teaching interval.

From the perspective of educational marketing, the parent is an indirect beneficiary, but a central evaluator of the service. Parents observe the child's stress, progress, autonomy and the time spent on homework. For this reason, the perceived value of a tool such as the Virtual Teacher includes functional, emotional and relational benefits: rapid support, reduced pressure, increased trust and the perception that the education provider offers solutions adapted to the real life of the family.

Customer relationship management in education involves more than administrative communication with parents. It includes understanding recurring needs, anticipating moments of friction and developing solutions that support trust. From this perspective, the Virtual Teacher can be read as an educational CRM tool: it does not merely add a digital function, but creates an additional contact point between the educational service and the family using it.

### 2.4 Ethical and pedagogical conditions for AI homework assistance

The use of AI in children's education requires firm boundaries. First, the tool must be aligned with the curriculum and must avoid content that is irrelevant or inappropriate for

the student's age. Second, it must respect the principle of complementarity: the human teacher remains responsible for designing learning, interpreting progress and validating the student's actual difficulties. Third, the solution must be designed so that it does not encourage copying or passivity, but guided effort.

These conditions are also supported by recent AI regulation. The European Artificial Intelligence Act, adopted in 2024, emphasises risk governance and protection in sensitive domains [8]. The present paper does not aim to provide a legal analysis, but it retains an important principle: in education, especially when users are minors, AI should be introduced gradually, verifiably and under human supervision.

Profesorul.ai is described in the working materials as an empathetic and patient assistant that does not provide direct answers, but offers useful guidance and encourages students to explore, learn and develop autonomy. This positioning forms the pedagogical basis of the paper and differentiates the tool from applications that deliver final solutions without the student's cognitive involvement.

## 3. Research objectives, questions and hypotheses

The general objective of the research is to analyse the extent to which an AI-based homework assistant, designed to provide step-by-step guidance, emotional support and explanations adapted to the student's level, can be perceived as a valuable service innovation in private education, with the potential to support homework completion, persistence, autonomy and parental satisfaction.

The specific objectives are to identify the main difficulties encountered by students and parents in the homework process; to evaluate the opportunity of introducing an AI-based homework assistant in private education; to analyse parents' perceived value; to investigate students' perception of step-by-step guidance; to evaluate teachers' perception of the complementary role of the tool; to analyse expected learning outcomes; and to formulate a conceptual framework regarding AI-based homework assistance as a service innovation.

The research questions address homework-related difficulties, the opportunity of using AI for students in grades IV-VIII, the influence of permanent availability and step-by-step guidance on perceived value, the role of the tool in reducing family stress, its capacity to support students when they get stuck, teachers' evaluation of its usefulness and limitations, and the expected learning outcomes.

| Hypothesis | Statement |
|---|---|
| H1 | The perceived need for additional homework support positively influences the acceptance of an AI-based homework assistant in private education. |

| | |
|---|---|
| H2 | The perceived usefulness of the Virtual Teacher positively influences parents perceived value of the private educational service. |
| H3 | Step-by-step guidance without providing direct answers positively influences the perceived autonomy of the student. |
| H4 | The permanent availability of the AI assistant is positively associated with the perceived reduction of homework blocks. |
| H5 | The empathetic and encouraging character of the assistant positively influences students motivation to continue homework when difficulties occur. |
| H6 | Parents perception of safety, curricular relevance and controlled use positively influences trust in the assistant. |
| H7 | The perceived value of the Virtual Teacher positively influences parents satisfaction and recommendation intention. |
| H8 | Teachers/tutors perceive the AI assistant as useful in a complementary role, provided that it remains aligned with the school curriculum. |

Table 1. Research hypotheses

## 4. Research methodology

The research was designed as an exploratory pilot study with a mixed quantitative and qualitative design. Its purpose is not to demonstrate a definitive educational impact, but to understand the conditions under which an AI-based homework assistant may be considered timely, acceptable and valuable. This distinction is important: the study measures perceptions, intentions to use and expected learning outcomes, not longitudinal academic performance.

The pilot study was configured for February-March 2025, over a period of four weeks, during a regular school interval. This timing is relevant because students have constant homework, current tests and revision activities, while the need for support appears naturally. The research was placed in a private educational training setting, with the testing of the Profesorul.ai concept as its starting point.

The analysed subjects were Mathematics and Romanian Language, as these were the subjects available in the testing stage of the Virtual Teacher. The platform allows interaction through text, voice or image, use from a phone, tablet, laptop or desktop, and task submission by writing, dictation, photographing or uploading images. These functions directly influenced the design of the questionnaire items and the feedback grid.

The research uses a simulated pilot dataset built on a private educational training setting, the beta-testing structure of Profesorul.ai and the profile of target users. This

methodological choice makes it possible to build a plausible empirical scenario for analysing opportunity and perceived impact. The dataset is not presented as a real measurement of academic performance, but as an exploratory instrument for potential adoption.

| Respondent category | Number of respondents | Profile |
|---|---|---|
| Parents | 120 | Parents of students in grades IV-VIII |
| Students | 80 | Students in grade IV and lower-secondary education |
| Teachers/tutors | 10 | Teachers/tutors involved in testing |
| Total | 210 | Participants in the simulated pilot scenario |

Table 2. Structure of the pilot sample

The quantitative component included structured questionnaires for parents and students. For parents, the items referred to the child's homework difficulties, the frequency of learning blocks, family time availability, homework-related stress, perceived usefulness of the AI assistant, safety, curricular relevance, perceived value, anticipated satisfaction and recommendation intention. For students, the items were phrased in accessible language and addressed homework blocks, preference for step-by-step explanations, comfort in interacting with a virtual assistant and willingness to continue the task when support is received.

The qualitative component consisted of collecting feedback from the teachers/tutors involved in testing, through an observation grid. It examined the correctness of explanations, the adequacy of responses to grade level, curriculum alignment, the capacity to guide without giving the direct answer, the quality of encouragement, usefulness for homework and revision, interpretation errors, voice transcription issues, response time and optimisation recommendations.

Quantitative data were analysed descriptively, using frequencies, percentages and mean scores on a five-point Likert scale. Qualitative data were analysed thematically, by grouping teachers' observations into categories such as pedagogical usefulness, curricular adequacy, autonomy, guidance, technical limitations, risks and recommendations. By combining the two components, the study provides a nuanced picture of potential adoption without claiming statistical generalisation.

Ethical considerations were integrated into the research design. Student participation presupposes parental consent, data are analysed in aggregated form, and the tool is presented as educational support, not as a replacement for the teacher. In addition, the

central characteristic of the Virtual Teacher is that it does not provide direct answers, but supports students in reaching the result through hints and explanations.

## 5. Results and analysis

The results presented in this section are based on the simulated pilot dataset described above. The analysis is organised around the three main dimensions of the research: the opportunity of using an AI-based homework assistant, perceived value for parents and students, and expected learning outcomes. Tables and graphics are used to make the dominant trends visible, while the interpretations emphasise the caution required when reading the data.

### 5.1 Respondent profile

| Child grade | Number of parents | Percentage |
|---|---|---|
| Grade IV | 24 | 20.0% |
| Grade V | 26 | 21.7% |
| Grade VI | 28 | 23.3% |
| Grade VII | 22 | 18.3% |
| Grade VIII | 20 | 16.7% |
| Total | 120 | 100% |

Table 3. Distribution of parents by child grade

The parent sample is relatively balanced across grades IV-VIII, with a slightly higher share for grades V-VI. This distribution is useful for analysis because homework volume increases in these grades and students move towards greater autonomy. This is precisely the area where blocks often appear: the child is old enough to work alone, but not always confident enough to overcome a difficult task without support.

| School level | Number of students | Percentage |
|---|---|---|
| Grade IV | 18 | 22.5% |
| Grades V-VI | 34 | 42.5% |
| Grades VII-VIII | 28 | 35.0% |
| Total | 80 | 100% |

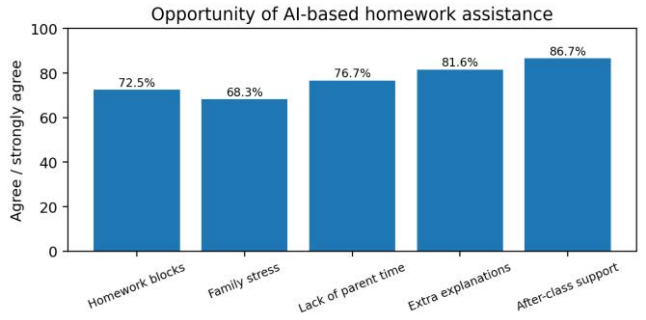
Table 4. Distribution of students by school level

Lower-secondary students represent 77.5% of the sample, which is appropriate for analysing the use of an AI-based homework tool. They already have a higher level of digital autonomy and face more complex tasks, especially in Mathematics and Romanian Language. The presence of fourth-grade students nevertheless preserves the link with the transition into a more demanding stage of schooling.

## 5.2 Opportunity of AI-based homework assistance

| Item evaluated by parents | Agree / strongly agree | Mean score 1-5 |
|---|---|---|
| My child frequently gets stuck with homework | 72.5% | 4.08 |
| Homework generates stress in the family | 68.3% | 3.94 |
| I do not always have time to help my child with homework | 76.7% | 4.21 |
| My child needs additional explanations | 81.6% | 4.32 |
| Support available outside class hours would be useful | 86.7% | 4.47 |

Table 5. Parents perception of homework-related difficulties




Graphic 1. Opportunity of using AI homework assistance from parents perspective

The results show that the main problem identified by parents is not the complete absence of educational support, but its discontinuity. More than three quarters of parents state that they do not always have time to help their child with homework, while more than 80% consider that the student needs additional explanations. The highest mean score, 4.47, is recorded for the usefulness of support available outside regular teaching hours.

These data indicate a service opportunity, not only a technological opportunity. An AI assistant may have value when it responds to a concrete need: the student gets stuck at a moment when the teacher is not available and the parent cannot intervene effectively.

In a private educational training setting, such a tool can complement the core service and reduce the gap between guided learning and individual work at home.

| Item evaluated by students | Agree / strongly agree | Mean score 1-5 |
|---|---|---|
| I sometimes do not know how to start homework | 70.0% | 3.96 |
| I temporarily give up when I do not understand the task | 58.7% | 3.61 |
| I would like to receive step-by-step explanations | 83.8% | 4.35 |
| It helps me when someone gives hints, not the direct answer | 78.8% | 4.18 |
| I would use a virtual assistant if it were easy to use | 75.0% | 4.06 |

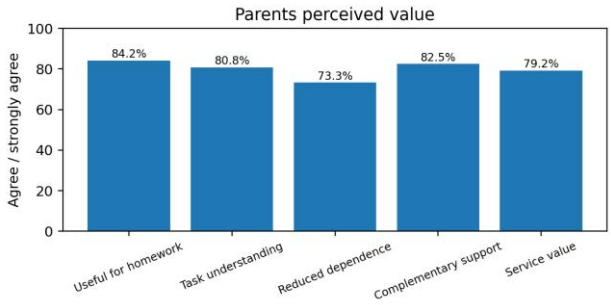
Table 6. Students perception of homework blocks

From the students' perspective, the results show that the initial block is a significant problem. 70% state that they sometimes do not know how to start a homework task, and 58.7% temporarily give up when they do not understand the requirement. At the same time, 83.8% prefer step-by-step explanations, while 78.8% appreciate hints instead of direct answers. This combination confirms the importance of guidance that supports the student's effort rather than replacing it.

### 5.3 Perceived value for parents

| Item evaluated by parents | Agree / strongly agree | Mean score 1-5 |
|---|---|---|
| The Virtual Teacher can be useful for homework completion | 84.2% | 4.39 |
| It can help the child better understand tasks | 80.8% | 4.26 |
| It can reduce the childs dependence on parent help | 73.3% | 4.02 |
| It can complement the support provided by the teacher/tutor | 82.5% | 4.31 |
| It can add value to the private educational service | 79.2% | 4.17 |

Table 7. Perceived usefulness and perceived service value




Graphic 2. Perceived value of Profesorul Virtual from parents perspective

The results indicate a favourable perception of the usefulness of the tool. More than 84% of parents consider the Virtual Teacher useful for homework completion, while 82.5% perceive it as complementary to the support provided by the teacher or tutor. This interpretation is important because it reduces the risk of positioning the tool as a substitute for the human teacher and places it instead in the area of controlled extension of the educational service.

From the perspective of educational marketing, perceived value is not a single indicator. It consists of functional value, through rapid homework support; emotional value, through the reduction of tension and blockage; and relational value, through increased trust that the education provider understands the real needs of the family. This interpretation explains why an apparently technological tool may have effects on satisfaction and loyalty.

| Item evaluated by parents | Agree / strongly agree | Mean score 1-5 |
|---|---|---|
| It is important that the tool is limited to the school curriculum | 91.7% | 4.68 |
| It is important that the tool does not provide direct answers | 85.0% | 4.43 |
| I would trust it more if the platform were tested by teachers | 89.2% | 4.61 |
| I would trust it if it were used in a controlled educational setting | 87.5% | 4.55 |
| Child safety in AI interaction is essential | 95.0% | 4.82 |

Table 8. Trust and safety conditions perceived by parents

The acceptance of AI in children's education is strongly conditioned by control, safety and curricular relevance. The highest mean score, 4.82, is obtained by the item regarding

child safety. This result shows that parents do not seek unrestricted AI interaction, but a controlled educational environment. In addition, 91.7% consider curriculum limitation important, while 89.2% state that testing by teachers would increase trust.

### 5.4 Expected learning outcomes from students perspective

| Item evaluated by students | Agree / strongly agree | Mean score 1-5 |
|---|---|---|
| I feel more encouraged when I receive step-by-step hints | 81.3% | 4.29 |
| I would continue homework more easily if I received immediate help | 85.0% | 4.41 |
| I feel less stressed when someone explains without criticising me | 87.5% | 4.56 |
| I would have more confidence that I can solve tasks myself | 76.3% | 4.12 |
| I would like the assistant to explain calmly several times | 88.8% | 4.63 |

Table 9. Expected educational outcomes from students perspective

Students particularly value patience, calmness and the possibility of receiving repeated explanations. The highest mean score, 4.63, is associated with the wish that the assistant explain calmly several times if needed. This result is significant because repeatable patience is one of the features through which an AI tool can complement human support without replacing it.

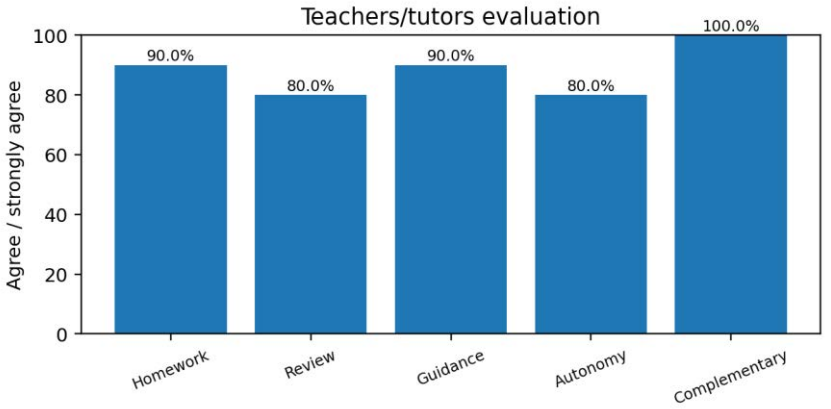
Another important result is that 85% of students state that they would continue homework more easily if they received immediate help. Based on this study, it cannot be claimed that the tool directly improves school performance. It can be argued, however, that it supports behaviours that precede performance: persistence, repeated attempts, clarification of requirements and self-confidence.

### 5.5 Teachers/tutors feedback

| Evaluated dimension | Agree / strongly agree | Mean score 1-5 |
|---|---|---|
| The tool is useful for homework support | 90.0% | 4.40 |
| The tool may be useful for revision | 80.0% | 4.10 |

| | | |
|---|---|---|
| Step-by-step guidance is suitable for blocked students | 90.0% | 4.50 |
| The tool may contribute to student autonomy | 80.0% | 4.20 |
| The tool must be used as complementary, not as a substitute | 100.0% | 4.90 |

Table 10. Teachers/tutors evaluation of pedagogical utility




Graphic 4. Teachers/tutors evaluation of Profesorul Virtual

| Observed limitation or risk | Teachers who mentioned it | Percentage |
|---|---|---|
| Possible errors in task interpretation | 7 out of 10 | 70.0% |
| Need to verify explanations for complex exercises | 6 out of 10 | 60.0% |
| Occasional problems in voice interaction | 5 out of 10 | 50.0% |
| Risk of passive use by students | 4 out of 10 | 40.0% |
| Need for continuous pedagogical monitoring | 8 out of 10 | 80.0% |

Table 11. Limits and risks identified by teachers/tutors

Teachers' feedback confirms the pedagogical potential of the tool, but also introduces a necessary note of caution. 90% of teachers consider the tool useful for homework support, while 100% emphasise that it must be used as a complementary instrument. This conclusion is essential for responsible AI integration in education: technology may

support explanation and practice, but it cannot replace pedagogical judgement, the human relationship and contextual evaluation by the teacher.

The risks identified by teachers are relevant for further development. 70% mentioned possible errors in task interpretation, while 80% indicated the need for continuous pedagogical monitoring. These results do not invalidate the opportunity of the tool; rather, they define the conditions for implementation: testing, optimisation, curricular limitation, expert verification and transparent communication with parents.

### 5.6 Hypotheses assessment

| Hypothesis | Result | Synthetic argument |
|---|---|---|
| H1 | Supported | The need for additional support and the usefulness of after-class support show high values. |
| H2 | Supported | Perceived usefulness is associated with perceived value of the educational service. |
| H3 | Supported | Students and parents appreciate guidance without direct answers. |
| H4 | Supported | Immediate help is associated with continuing homework when blocks occur. |
| H5 | Supported | Calm and encouraging interaction is linked to motivation and stress reduction. |
| H6 | Supported | Safety, curricular control and teacher testing increase trust. |
| H7 | Supported | Perceived value supports satisfaction and recommendation intention. |
| H8 | Supported | Teachers consider the tool useful, but only in a complementary role. |

Table 12. Synthetic assessment of research hypotheses

The hypotheses assessment shows support for all formulated directions, within the limits of an exploratory pilot study based on simulated data. Interpretation must therefore remain cautious: the results indicate high adoption potential and favourable perceived value, not a definitive validation of impact on academic performance. This distinction is important for the credibility of the study and for the design of future research.

## 6. Discussion: AI-based homework assistance as service innovation

The results support the idea that the Virtual Teacher can be analysed as a service innovation in private education. The innovation does not lie only in the use of AI, but in the way technology changes the beneficiary experience. For the student, support

becomes more continuous because it is no longer limited to the lesson or to the parent's availability. For the parent, the service becomes more valuable because it reduces homework-related pressure and increases the feeling of safety. For the teacher, the tool may take over part of the repetitive support without replacing the role of pedagogical design and validation.

Based on the results, a conceptual model of AI-based homework assistance in private education can be proposed. The model starts with the need for additional support and the frequency of learning blocks. These elements generate interest in a permanently available tool. The value of the tool then depends on four characteristics: step-by-step guidance, empathetic interaction, adaptation to the student's level and curricular limitation. These characteristics influence student persistence, stress reduction, autonomy and parental satisfaction. Finally, parental satisfaction and the perception of innovation may support loyalty and recommendation intention.

From a CRM perspective, the AI assistant becomes an additional contact point between the institution and the family. Even if the actual interaction takes place between the student and the platform, the value is also evaluated by the parent. Implementation should therefore be accompanied by clear communication: what the tool can do, what it should not do, why it does not provide direct answers, how it is tested, how data are protected and how curriculum alignment is ensured.

From a pedagogical perspective, one of the most important observations is that students appreciate repeated explanations and the absence of criticism. This result suggests that homework abandonment may be linked to emotional and relational factors, not only cognitive ones. A correctly calibrated empathetic AI assistant can create a space for trying without embarrassment and without fear of immediate judgement. However, this advantage must be balanced against the risk of dependence and the need to preserve student effort.

From a technical perspective, teachers' feedback shows that responsible implementation requires continuous monitoring. Interpretation errors, voice difficulties and insufficiently calibrated explanations may quickly affect trust. Therefore, the development of such a tool should include testing protocols, feedback collection, curriculum updates and mechanisms through which teachers can validate and improve responses.

## 7. Conclusions

The paper analysed the opportunity of using an AI-based homework assistant as a service innovation in private education, starting from the concept of Profesorul.ai/Virtual Teacher, examined in a private educational training setting. The research was designed as an exploratory pilot study based on a simulated dataset, with 120 parents, 80 students and 10 teachers/tutors. The results indicate a significant opportunity, favourable

perceived value and positive expectations regarding persistence, autonomy and reduced homework-related stress.

The first conclusion is that homework represents a critical area of the educational experience, where the need for support frequently appears outside formal teaching time. More than 80% of parents consider that the student needs additional explanations, while 86.7% consider support available outside regular teaching hours useful. This finding confirms the existence of a real opportunity for AI-based assistance, provided that the tool is responsibly integrated.

The second conclusion is that parents' perceived value depends on safety, curricular control and the complementary role of the tool. Parents do not respond favourably to an unrestricted AI solution, but to a tool tested by teachers, adapted to age and designed to guide without providing direct answers. In this respect, positioning the Virtual Teacher as an assistant rather than a substitute for the teacher is essential.

The third conclusion is that students value calm, encouraging and repeatable explanations. The results suggest that an AI assistant may reduce temporary homework abandonment by offering immediate support at moments of blockage. The expected impact therefore does not refer only to the correctness of homework, but to learning behaviours such as persistence, confidence and autonomy.

The fourth conclusion concerns the role of teachers. Their feedback validates the usefulness of the tool for homework and revision, but also underlines the need for pedagogical monitoring. AI can support the educational process, but pedagogical decisions, interpretation of progress and the educational relationship remain the responsibility of the human teacher.

The contribution of the paper consists in proposing an integrated perspective on AI-based homework assistance as a service innovation in private education. This perspective connects artificial intelligence with educational marketing, customer relationship management and expected learning outcomes. Future research should include a longitudinal study with real usage data, comparison of performance before and after tool integration, extension to other subjects and testing of the model on larger samples.

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