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Engagement, feedback and the educational relationship. A pilot study on the use of AskLea to enhance basic skills in lower secondary schools

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Abstract: This paper presents a mixed-methods pilot study on the use of AskLea in lower secondary schools, focusing on the relationship between lesson planning, formative feedback, engagement and the educational relationship. The research stems from a 20-hour training programme for 24 teachers; four pilot teachers, two teaching Italian and two teaching Mathematics and Science, designed activities for four Year 3 classes, two of which were involved in the intervention and two of which formed a non-equivalent control group. The paper analyses pre- and post-tests, observation grids, materials produced using the platform, teacher diaries and focus groups. Initial descriptive and qualitative data show that the guided use of the platform made learning objectives, recurring errors and feedback criteria more explicit. The conclusions discuss the limitations and implications for effective digital mediation, which is only achievable when supported by explicit pedagogical guidance capable of transforming errors, data and feedback into opportunities for co-regulation.

Keywords: engagement; formative feedback; artificial intelligence; educational relationship; basic skills

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1. Introduction

The introduction of digital platforms based on artificial intelligence in school settings requires us to avoid two symmetrical oversimplifications: on the one hand, the technocratic interpretation, which attributes to the tool an almost autonomous capacity for improvement; on the other, the defensive interpretation, which regards any form of automation as an impoverishment of the teacher's role. From a pedagogical and didactic perspective, the most fruitful question concerns the teaching conditions within which a platform is integrated into lesson planning, alters the quality of feedback and supports student engagement. The educational value of technologies does not lie in their mere introduction into the school context, but depends on the alignment between objectives, tasks, teacher mediation and conditions of use (Calvani, 2013; Ranieri, 2011). Technology, in fact, does not operate in a neutral space, but is embedded within professional cultures, assessment routines, students' expectations and the school's organisational constraints. For this reason, this study adopts pedagogical direction as its interpretative framework: the teacher does not delegate teaching decisions to the platform, but governs the relationship between objectives, materials, data, interactions and feedback, according to a logic consistent with hybrid human-digital perspectives that distinguish between technological support and educational responsibility (Molenaar, 2022).

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This study is situated within the framework of Engaging Education and interprets engagement as a multidimensional construct. Fredricks, Blumenfeld and Paris (2004) distinguish between behavioural, cognitive and emotional components: participating in a task, persisting in the face of difficulty, revising an ineffective strategy and attributing meaning to schoolwork are not overlapping dimensions, but aspects of the same process. This perspective helps to avoid confusing visible activity with deep engagement. A pupil may be engaged in completing an exercise whilst, at the same time, failing to understand the criteria of the task; or they may show uncertainty, ask questions and rework their mistake, revealing a more substantial level of cognitive engagement.

Ryan and Deci's (2000) Self-Determination Theory helps to clarify this point further, as it links motivation and well-being to the needs for autonomy, competence and relatedness. In lower secondary school, particularly when working on text comprehension and problem-based tasks, the perception of not understanding can lead to avoidance, dependence on an adult's answer or mechanical adherence to key words. A digital environment can contribute to engagement only if it does not replace the relational experience of learning, but rather makes it more structured: more explicit objectives, shared criteria, graded materials, clear feedback and the opportunity to correct mistakes.

Feedback is the point of contact between planning, assessment and the educational relationship. Hattie and Timperley (2007) describe it as information that guides the pupil with regard to the task, the process, self-regulation and the self; Black and Wiliam (1998) situate it within the framework of formative assessment, where the information generated by activities is used to modify teaching and learning. The perspective of Nicol and Macfarlane-Dick (2006) also allows us to link feedback and self-regulation, since effective feedback does not merely highlight the discrepancy from the expected outcome, but supports the student's ability to understand criteria, strategies and next steps. Similarly, Shute (2008) interprets formative feedback as information capable of modifying thought and behaviour with a view to improvement. From this perspective, the data is not educational in and of itself, but rather insofar as it is interpreted by the teacher, communicated to the student and transformed into a teaching decision. The risk with platforms is that they multiply outputs and indicators without genuine mediation; the pedagogical opportunity, on the other hand, lies in making them the subject of dialogue, clarification and co-regulation.

The case study concerns AskLea, a platform designed to support teachers' professional development. The documentation provided to teachers enables them to activate their account, set up their professional profile and tailor their responses according to the pupils' educational level; the section dedicated to the virtual classroom allows for the creation of classes, the management of pupils and the use of assigned interactions. The teaching functions include the design of lesson plans, the generation of materials, quizzes and rubrics, as well as accessibility tools such as text-to-speech, voice control, colour contrast and highly legible fonts. The reference to Bloom's taxonomy, in the version revised by Anderson and Krathwohl (2001), has been adopted by teachers as a criterion for moving away from purely executional tasks towards tasks that require understanding, justification and argumentation. In this context, askLea is regarded as a digital tool to support lesson planning rather than as a self-contained environment: its educational effectiveness

stems from the teacher's pedagogical guidance, the selection of learning objectives, the quality of the tasks set, and the transformation of feedback during collaborative revision (Bonaiuti et al., 2016; Rivoltella & Rossi, 2019).

The study began at the end of the 2025/2026 academic year with a 20-hour training course held at the 'Madonna della Camera' Comprehensive School in Monteparano, in the province of Taranto, comprising the Monteparano, Faggiano and Roccaforzata school complexes. Twenty-four teachers took part in the training. Within this group, four teachers directly involved in the classes under investigation – two teaching Italian and two teaching Maths and Science – designed and delivered activities using the platform. The subjects were chosen in relation to two core areas of competence deemed to be priorities: reading comprehension in Italian and understanding problem-based questions in Maths, with a focus on preparation for the final INVALSI test at the end of the first cycle.

The overall objective is to analyse how the pedagogically-oriented use of AskLea, following a teacher training programme, can support formative feedback practices, the development of basic skills and the quality of the educational relationship. There are three research questions: what changes emerge in the ways in which teachers using AskLea plan and document their teaching? What descriptive and interpretative differences are observed between classes involved in the intervention and control classes with regard to text comprehension and problem-based tasks? How do materials, rubrics and feedback produced or adapted using the platform affect participation, error management and co-regulation in the classroom?

2. Methods

The study is designed as a mixed-methods pilot study, akin to a case study with an embedded comparative component. This choice does not stem from a need to demonstrate the causal effectiveness of the platform, but rather from the need to understand how a training intervention, a digital environment and feedback practices can combine within a real-world school context. The quantitative component adopts a quasi-experimental pre-test/post-test design with a non-equivalent comparison group; the qualitative component reconstructs teaching practices, artefacts produced, professional feedback and relational dynamics observed in the classes involved (Creswell & Plano Clark, 2018).

The training sample comprises 24 teachers (Table 1). The implementation sample is more limited and includes four teachers: two teaching Italian and two teaching Mathematics and Science. They teach in four Year 3 classes in lower secondary school: two experimental classes, comprising a total of 36 pupils, carried out activities designed with the support of AskLea; two control classes, comprising a total of 33 pupils, worked on the same core competencies without activities designed using the platform. The distinction between a broad ' ' and a narrow 'implementation' is methodologically significant, as it prevents evidence observed only in the classes directly involved from being attributed to the entire teaching staff.

Table 1. Breakdown of participants and levels of involvement

Level	Participants	Role in the study
Teacher training	24 teachers	Participation in the 20-hour course on the pedagogical use of Ask-

		Lea
Teaching implementation	4 teachers	2 Italian teachers and 2 Maths and Science teachers plan and deliver the activities in the participating classes
Pilot classes	2 Year 3 classes, N=36	Italian and Maths/Science activities designed using AskLea
Control classes	2 Year 3 classes, N=33	Standard curriculum covering the same core competencies, without activities designed using AskLea

The procedure is divided into four stages. In the first stage, teachers tested the platform's functions during training, with particular attention to formulating pedagogically relevant requests, reviewing outputs and developing materials consistent with subject-specific objectives and cognitive levels. In the second stage, the four participating teachers designed activities for their classes, producing quizzes, worksheets, rubrics, group assignments and remedial materials. In the third phase, these materials were implemented in the two experimental classes; in the two control classes, the same core curriculum topics were covered without the planned use of the platform. In the fourth phase, artefacts, observations, diaries and teachers' feedback were collected.

The tools were designed to integrate learning, processes and teacher mediation. For Italian, initial and final tests of text comprehension are planned, focusing on explicit information, inferences, vocabulary, textual coherence, overall comprehension and the ability to justify answers using textual clues. For Mathematics, the tests assess understanding of problem statements: identifying relevant data, recognising the task requirement, logical relationships, choosing a solution strategy and checking the plausibility of the answer. The tests were designed by operationalising the objectives into observable cognitive processes, with a focus on distinguishing between subject-specific content, the task instruction, the required operation and the assessment criteria (Trinchero, 2022). Alongside the tests, observation grids (Table 2) were prepared to assess engagement, participation, error management and the quality of teaching interactions; a logbook for the participating teachers; an analysis sheet for the artefacts produced using AskLea; and a final focus group with the four teachers directly involved.

Table 2. Summary observation grid for engagement, feedback and the educational relationship

Dimension	**Observable indicator**	**Low level (1)**	**High level (4)**
Behavioural engagement	Task participation	Performs only when prompted	Initiates and maintains the work consistently
Cognitive engagement	Justification of answers	Answers without giving reasons	Links the answer, clue and reasoning
Handling of errors	Willingness to review the answer	Interprets the error as a failure	Uses the error to reformulate the strategy
Feedback	Use of the teacher's feedback	Passively accepts the correction	Turns feedback into follow-up action
Educational	Support-oriented interactions	Seeks confirmation only on	Seeks clarification on the process

relationship		the outcome	and collaborates with peers

The analysis of project artefacts was aimed at understanding how digital technology is translated into a teaching tool, that is, into a deliberate configuration of tasks, materials, criteria, feedback and interactions (Bonaiuti et al., 2016). This approach stems from a methodological precaution: it is not enough to state that a platform has been used; it is necessary to specify which materials were produced, how they were adapted by the teacher and what role they played in the teaching sequence. Figure 1 shows a composite screenshot of an Italian lesson designed by teachers to identify inferences in a narrative text.



Figure 1. Collage of an Italian language activity designed using AskLea: task instructions, group roles and verbalisation of inferences

Table 3. Analysis matrix for the activity 'Detectives between the lines: The Return of Aeneas'

Activity component	**Teaching function**	**Competence indicator**	**Use of feedback**
Initial instructions	Makes the objective clear: to distinguish between facts and inferences	Understands that the text contains explicit and implicit information	Initial guidance and anticipation of the assessment criteria
Logical model of inference	Links textual clues, prior knowledge and inference	Distinguishes between textual evidence and personal deduction	Feedback on the reasoning process, not just on the answer
Group roles	Distributes responsibilities and speaking turns	Participates in a structured manner in formulating the answer	Peer feedback and reasoned discussion
Investigation report	Asks students to link inferences and clues	Justifies the answer on the basis of textual evidence	Formative marking focused on justification

	within the text		
Logical challenge	Encourages emotional interpretation and implicit meaning	Integrates literal comprehension, narrative recall and inference	Guided discussion and reorientation of weak interpretations

3. Results

The results presented are preliminary and derive from the integration of descriptive data, materials produced, classroom observations and feedback from the participating teachers. The pre-post comparison of the Italian and Mathematics tests is currently being finalised and is not used here to support causal inferences. Instead, the data already available in descriptive and qualitative form are analysed: sample structure, teaching materials, observation grids and initial professional feedback. This approach preserves the coherence of the pilot design: the study does not aim to demonstrate that AskLea automatically improves learning, but rather to identify the conditions under which the strategic use of the platform can alter the quality of teaching mediation.

The first point concerns the nature of the intervention. The two experimental classes did not simply complete digital exercises, but worked on materials developed by the teachers following their training. In the Italian lesson documented in Figure 1, the platform was used to organise a sequence centred on inferences: explicit instructions, a logical model, guided reading, cooperative roles and investigative dialogue (Table 3). This approach is significant because it shifts the focus from the correct answer to the reasoning behind it. Pupils are required to indicate not only 'what they have understood', but also 'from which words they understood it', thereby making the link between the textual evidence and the deduction observable.

The second finding concerns the visibility of errors. Teachers' feedback reveals that the most frequent errors do not merely concern a lack of understanding of the text or the problem, but rather a difficulty in making the inferential process explicit. Some pupils formulate plausible answers that are not, however, grounded in the text; others identify isolated words without placing them within a chain of meaning. The activity on inferences made it possible to distinguish between intuitive answers, textual clues and reasoned explanations. In terms of assessment, this allows for less generic feedback: not 'you got it wrong', but 'your inference is not yet supported by sufficient textual evidence' or 'you found the clue, but you need to make the logical step explicit'.

The third finding concerns participation. The introduction of group roles – coordinator, secretary and spokesperson – helped to regulate speaking turns and gave even the most hesitant pupils a recognisable role. In this case, engagement does not simply mean a general liveliness in the classroom, but rather the opportunity to take part in a progressively structured argumentative task. Cooperative work proved particularly valuable when the teacher drew on the groups' responses to compare different inferences, asking pupils to indicate which was most firmly grounded in the text and why.

The fourth finding concerns the transformation of feedback. Teachers report that the materials prepared using AskLea facilitated the preparation of more analytical feedback, as the assignment itself already incorporated the marking criteria:

identifying the inference and justifying it with a clue. In this sense, the platform does not directly generate feedback, but helps the teacher to design conditions in which feedback is more targeted. The decisive mediation remains a professional one: choosing the appropriate output, simplifying it where necessary, checking its disciplinary consistency, adapting it to the pupils' level and discussing it in class (Table 4).

Table 4. Observational summary in the two experimental classes

Indicator	Experimental class 1	Experimental class 2	Observed evidence
Participation in the task	3.1/4	3.3/4	Greater continuity during the group stages and in the final discussion
Justification for the answer	2.6/4	2.8/4	Initial difficulty in linking inference and clue; improvement following teacher modelling
Use of feedback	2.8/4	3.0/4	Pupils revise their answer when the feedback indicates the part to be corrected
Error handling	2.7/4	3.1/4	Errors are discussed as hypotheses to be tested against the text, not merely as negative outcomes

Table 5. Qualitative themes from the teacher's diary and final focus group

Code	Source	Explanatory extracts	Interpretative theme
E1	Italian Teacher's Diary	"With the worksheet on inferences, I could immediately see who was looking for clues in the text and who was answering based on their impressions. The discussion became more precise."	Visibility of the inferential process
E2	Focus group	"The platform didn't mark the work for me; it helped me prepare a more organised mark, because the assessment instructions already asked for reasons to be given."	Feedback as design
E3	Mathematics teacher's diary	"In the problem-based questions, the main challenge was often understanding what was being asked. After separating the data, the question and the strategy, some calculation errors became easier to understand."	Understanding the problem
E4	Focus group	"The roles within the group helped the quieter pupils: they didn't necessarily have to speak straight away, but they had a clear task to perform."	Participation and belonging
E5	Italian Teacher's Diary	"When mistakes became clues to the thought process, the pupils rewrote their work with less resistance."	Emotional management of mistakes
E6	Focus group	"The point isn't simply to ask AskLea for a worksheet and use it as it is: the real work lies in choosing the objective, reviewing the questions, adapting them to the class and then incorporating them into	Teacher-led pedagogical guidance

		the discussion."	

A further consideration concerns pedagogical guidance. Teachers' feedback does not justify interpreting AskLea as an autonomous teaching tool: the platform functioned as a support when the teacher defined the objective, checked the relevance of the outputs, transformed the worksheet into a practical activity and addressed errors during the group discussion (Table 5). The quality of the intervention therefore depends on the professional ability to manage the sequence of planning–activity–feedback–reformulation, ensuring that the digital material does not remain an isolated product but instead becomes an opportunity for co-regulation. In this regard, human-digital collaboration only acquires educational value if it is integrated into social processes of learning regulation and not reduced to the automatic production of content (Järvelä et al., 2023).

Overall, the preliminary results indicate that the use of the platform has had a particular impact on task design and the quality of feedback. The activity on inferences allows us to observe three stages: the articulation of the cognitive criterion, the allocation of cooperative roles, and the requirement to verbalise the link between the answer and the textual evidence. This structure makes the task more authentic from a pedagogical perspective, as it does not merely require the selection of an answer, but demands that the process justifying that answer be demonstrated. Engagement, therefore, appears to be linked not to the novelty of the tool, but to the clarity of the instructions, the opportunity for discussion, and the transformation of errors into subjects for collaborative work.

4. Discussion and Conclusions

The study suggests that a platform such as AskLea can have pedagogical value when it is situated within a chain of professional mediations. This chain can be described as pedagogical direction: a set of intentional decisions through which the teacher selects objectives, critically examines outputs, adapts materials and rubrics to the class, organises interaction and transforms feedback into regulatory action. Teacher training, the review of outputs, the construction of rubrics and the delivery of feedback therefore constitute the core of the intervention, whilst the platform remains a support tool. In the absence of such pedagogical direction, there is a risk of reducing artificial intelligence to a mere generator of assessment sheets; with explicit mediation, however, it can help to make errors more legible, feedback more reasoned and the correction process more participatory. This interpretation is consistent with the notion of human-digital hybrid technologies, in which educational value depends on the controlled transfer of information and responsibility between the system, the teacher and the students, rather than on the replacement of professional judgement (Molenaar, 2022).

The second element concerns feedback. The documented activity shows that feedback becomes formative when it is provided in advance of the assignment and not merely appended at the end. Asking the student to link inference with textual clues means creating a context in which marking can focus on the process: the teacher does not merely assess the final answer, but the relationship between the task, prior knowledge and deduction. This structure is consistent with the literature on formative assessment, as it transforms information about errors into operational

guidance for the next step and progressively supports the student's self-regulation (Nicol & Macfarlane-Dick, 2006; Shute, 2008).

The third element concerns engagement. The level of participation observed does not depend simply on the use of a digital interface, but on the social organisation of the task. Group roles, the requirement to verbalise reasoning, the discussion of alternatives and the collective review of errors make the task more accessible and less intimidating. The educational relationship is strengthened when the student perceives that a mistake does not bring the performance to an end, but rather opens up a path to clarification. In this regard, digital technology can support co-regulation only if it remains intertwined with the teacher's physical presence, active listening and professional judgement.

The study has obvious limitations. The sample is small, drawn from a single comprehensive school, and does not allow for generalisations. The classes were not randomly assigned; the comparison group is not equivalent and may differ from the classes involved in terms of uncontrolled variables. The qualitative evidence derives mainly from teachers and needs to be supplemented by students' perspectives, a systematic analysis of pre- and post-tests, and more extensive documentation of classroom interactions.

It is precisely these limitations that point the way forward. Given the insights this pilot study is providing, a subsequent phase could involve expanding the sample to include more schools, collecting longitudinal data, incorporating tools to gauge pupils' perceptions, comparing different types of activities, and analysing the quality of the outputs generated by the platform in greater detail.

In conclusion, the study shows that the enhancement of basic skills does not depend on technology per se, but on the teacher's ability to transform tools, data and materials into opportunities for interaction, clarification and the regulation of learning. From this perspective, 'Engaging Education' does not equate to an increase in digital activity, but rather to the creation of contexts in which participation, feedback and a sense of competence can mutually reinforce one another. In this light, AskLea can function as a mediator between planning, assessment and the educational relationship only when it remains within the framework of informed professional guidance.

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