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Slow Tech Innovation

AI, Ethics and New Teaching Methods

Generative AI as a Home Personal Tutor for Collaborative In-Class Discussion

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Università di Foggia

Studi Umanistici, Lettere, Beni Culturali, Scienze della Formazione

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Università di Foggia
Studi Umanistici, Lettere, Beni Culturali,

OER 6.1.2: Generative AI as a Home Personal Tutor for Collaborative In-Class Discussion
Reference Module: Module 6 - Classroom Practice and Authentic Assessment
Related Video-Pill: Video 6.1 - Active Methodologies & Flipped Classroom
Authoring partner: Panevėžys "Vyturys" Progymnasium - Lithuania
Topic / Thematic Focus: Generative AI home tutoring and collaborative in-class discussion

Introduction and Learning Objectives

This resource completes the pathway begun with OER 6.1.1 and accompanies video-pill 6.1 (Active Methodologies & Flipped Classroom). Whereas the previous resource reconstructed the reconfiguration of times and spaces, this one focuses on the most delicate point: what to do, in the home phase, when the student is left alone with the material. A conversational AI model, guided by the teacher, can restore to that phase a form of help - on one condition, however: that it be designed to make one think and not to provide answers.

The text connects to the evidence on the *flipped classroom* (van Alten et al., 2019; Strelan et al., 2020) and to the framework of active methodologies (Freeman et al., 2014), with a caution that runs through the whole resource: the home tutor is useful the more it stays anchored to the student's task and the less it takes the place of their reasoning. This is the constraint that distinguishes a teaching aid from a shortcut.

In the background of this resource remains the original formula of the *flipped classroom*, introduced by Lage, Platt and Treglia (2000).

By the end of the reading, the teacher will be able to:

- recognise the promise and the risks of AI as a home tutor in the *flipped classroom*;
- define the design constraints that prevent cognitive delegation (maieutics, chains of questions, no terminal answer);
- connect assisted home preparation to collaborative discussion in the classroom, safeguarding its traceability and equity.

1. AI as a home tutor: promise and risk

The home phase has a structural problem that we have seen: the student works alone, and no one is there to answer a question at the moment it arises. A conversational AI model can partly bridge this distance: reformulate an obscure passage, clarify a term, break down a line of reasoning, propose a calibrated verification question. Available at any hour, patient and inexhaustible, the artificial tutor seems tailor-made for the phase that suffers most from solitude.

But the same availability is also the danger. If the tutor provides the solution, the student does not carry out the cognitive work that preparation requires: the home phase is emptied and the *flipped classroom* loses its premise, because the classroom cannot rely on foundations that no one has built. The risk is not technical but pedagogical: it consists in turning a *scaffolding* into a substitute. The design question, then, is not whether to use the tutor, but how to constrain it.

On this point the literature on the *flipped classroom* offers an operational criterion. If the positive effects depend on the student's activity and not on passive consumption (van Alten et al., 2019), then the tutor is useful to the extent that it keeps preparation active; it is harmful to the extent that it replaces it. The same principle explains why checks at the start of the lesson remain indispensable even with the tutor: they verify that the home activity has actually taken place.

2. Maieutics, not solution: the constraints of the tutor

The first constraint is one of role: the tutor never provides terminal answers. It works through questions, reformulations and hints, according to a maieutic logic that helps the student find for themselves what they are looking for. An exemplary instruction, to be

shared with the class, is this: do not give me the solution, help me understand where I am going wrong, one question at a time. The wording is not a detail: it defines the behaviour of the system and, at the same time, the kind of cognitive work that remains with the student.
The second constraint is one of progressiveness: one question at a time, in a chain of thought. A tutor that delivers five explanations at once does not teach reasoning; a tutor that waits for the answer and calibrates the next step forces the student to commit, to formulate, to verify. It is in the slowness of the chain that the difference between a dialogue that educates and an output that seduces is played out.
The third constraint is one of authorship: the final synthesis, the conclusion, the choice between alternatives remain with the student. The tutor can show the pathway, not walk it in their place. It is a principle that the teacher can translate into explicit instructions, such as asking the system to have the student write the conclusion in their own words. In this way the home preparation is not merely done: it becomes thought through.

Parameter	Teaching constraint	Example instruction
Role	Never terminal answers; only questions and reformulations	Do not give me the solution: help me understand where I am going wrong, one question at a time.
Progressiveness	One question at a time, in a chain of thought	First ask me what I have understood; then offer a single hint.
Authorship	The final synthesis remains with the student	At the end, let me write the conclusion in my own words.
Traceability	Log of the interactions to be discussed in class	Keep the history of the *prompts* for the debriefing in the classroom.

3. The tutor that does not delegate: chains of questions and verification

Designing the tutor also means anticipating how one verifies that the help has not become delegation. The first strategy is the chain of questions: the system is asked to guide the student through a sequence that starts from what they know and proceeds step by step, without ever anticipating the outcome. It is a simple and verifiable device: if, at the end of the session, the student can reconstruct the reasoning, the tutor has worked as a *scaffolding*; if they can only repeat the system's answer, it has not worked.
The second strategy is the trace: requiring that the history of the interactions be kept. The sequence of *prompts* recounts the progression of thought - the initial framing, the model's answer, the student's evaluation, the correction - and becomes, in the classroom, the raw material of discussion. It is not used to monitor, but to make the process visible: what the student asked, how they reacted to a weak answer, whether they recognised an invention of the machine.
The third strategy is the debriefing in the classroom. The home preparation does not end at home: it ends when the student brings their reasoning to the group and exposes it to discussion. The tutor, in this perspective, is a bridge: it prepares the discussion that will follow, instead of replacing it. This is the connection that the next section makes explicit.

4. From home preparation to collaborative discussion

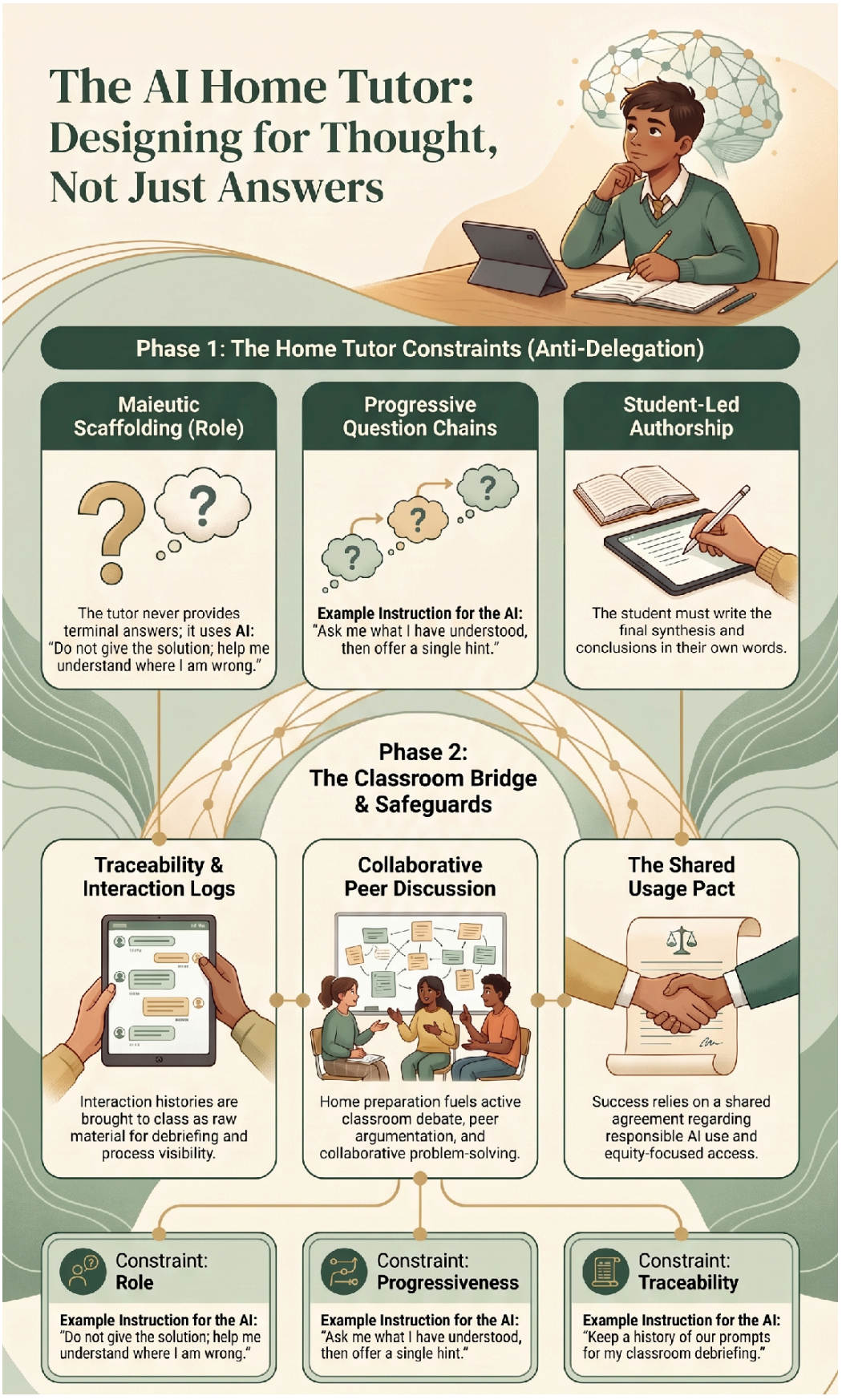
The *flipped classroom* is fully realised when classroom time is devoted to discussion and cooperative work. The home tutor serves precisely to make that moment possible: a student who has already encountered the material, who has formulated a hypothesis and who has tried to defend it is a better interlocutor than one who is listening for the first time. The help at home is not an end in itself; it is the condition of the conversation in class.
Here collaborative discussion takes on a specific formative function, consistent with active methodologies (Freeman et al., 2014): students compare their reasoning, correct one another, argue for their choices. The tutor does not take part in this moment - or takes part

only as material to be analysed - because peer discussion is precisely the kind of activity that AI cannot carry out in the student's place without emptying it.
From this architecture derives a single design principle: home and classroom are not two separate environments, but two phases of a single pathway. The home tutor must be designed with an eye to what will happen in the classroom; the classroom discussion must be designed counting on what the tutor will have made possible. When the two phases are conceived together, AI remains at the service of the reconfiguration; when they are conceived separately, the tutor risks becoming a small dispenser of answers at home.

5. Designing the safeguard: usage agreement, traces, check at the start

A sustainable use of the home tutor requires an explicit usage agreement, shared with the class. The agreement establishes what the tutor is for and what it is not for, which instructions are permitted, what must be documented. It is not a formal requirement: it makes students participants in the rule and shifts attention from prohibition to responsibility. As in home preparation in general, the clarity of the task is the first guarantee of effectiveness (van Alten et al., 2019).
Alongside the agreement are two safeguards already mentioned: the traceability of the interactions and the check at the start of the lesson. The first makes the process visible and feeds the discussion; the second verifies that the preparation has taken place and allows the classroom not to presuppose what is not there. Together, the two safeguards turn the home phase from an opaque zone into an observable segment of the learning pathway: this is the ground on which, in video-pill 6.4, the assessment of the process is grafted.
One final caution remains, concerning equity. The home tutor must not become a further factor of inequality: if it requires updated devices or stable connections, it penalises those who lack them. The same attentions apply to access: lightweight versions, use at school for those who cannot at home, no requirement for superior hardware. The guiding principle remains that of the previous resource: AI supports reflection when it arrives after the student has tried, and empties it when it arrives before.

Visual Scaffolding



Conclusions and Metacognitive Reflection Prompts

This resource has examined AI as a home tutor in the *flipped classroom*. The promise is to fill the solitude of the preliminary phase; the risk is to replace the cognitive work of the student. The design constraints - maieutics and no terminal answer, one question at a time, authorship of the synthesis left to the student, traceability of the interactions - serve to keep AI in the function of a *scaffolding*. The tutor makes sense, finally, if it prepares the collaborative discussion in the classroom: it is the connection between the two phases that gives meaning to the help at home.

To transfer these core ideas into one's own practice, the following reflection prompts are proposed:

- How would you word the initial instruction for a home tutor that must never give the solution, adapted to your subject?
- In what way would you use a student's history of interactions as material for classroom discussion, without turning it into monitoring?
- Which safeguard would you adopt to ensure that the home tutor does not penalise those with less adequate devices or connections?

Technical Metadata Sheet

Metadata Field	Specification / Parameter Value
Identifier	OER 6.1.2
Title	Generative AI as a Home Personal Tutor for Collaborative In-Class Discussion
Creator	Panevėžys "Vyturys" Progymnasium - Lithuania
Description	Complementing OER 6.1.1, the resource focuses on the home phase of the flipped classroom and on what happens when the student studies alone with a generative tutor. It defines the design constraints that prevent cognitive delegation — maieutics, chains of questions, no terminal answer — and links home preparation to collaborative in-class discussion. The practical focus is an oversight design made of use pacts, traces and opening checks.
Keywords	generative AI tutor; flipped classroom; maieutics; question chains; cognitive delegation; home preparation; collaborative discussion; oversight design
Language	EN (English)
Affiliation	Panevėžys "Vyturys" Progymnasium - Lithuania
Contributor	STIAEM Transnational Scientific Board (peer review, Rhodes validation protocol)
Media Format	Text; Infographics
Genre	Training Manual; Educational Guide
URL	
Citation	Bergmann, J., & Sams, A. (2012). Flip your classroom: Reach every student in every class every day. ISTE / ASCD. Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. Proceedings of the National Academy of Sciences (PNAS), 111(23), 8410-8415. https://doi.org/10.1073/pnas.1319030111 Lage, M. J., Platt, G. J., & Treglia, M. (2000). Inverting the classroom: A gateway to creating an inclusive learning environment. The Journal of Economic Education, 31(1), 30-43. https://doi.org/10.1080/00220480009596759 Strelan, P., Osborn, A., & Palmer, E. (2020). The flipped classroom: A meta-analysis of effects on student performance across disciplines and education levels. Educational Research Review, 30, 100314. https://doi.org/10.1016/j.edurev.2020.100314 van Alten, D. C. D., Phielix, C., Janssen, J., & Kester, L. (2019). Effects of flipping the classroom on learning outcomes: A meta-analysis. Educational Research Review, 28, 100305. https://doi.org/10.1016/j.edurev.2019.05.003
Educational Level	Secondary School
Associated Module / MOOC Video Lesson	Module 6 - Classroom Practice and Authentic Assessment / Video 6.1 - Active Methodologies & Flipped Classroom

Learning Objectives	recognise the promise and the risks of AI as a home tutor in the flipped classroom; define the design constraints that prevent cognitive delegation (maieutics, chains of questions, no terminal answer); link assisted home preparation to collaborative in-class discussion, safeguarding traceability and equity.
Rights	Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0)
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References and Webography

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