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ORIGINAL

Between verification and delegation: the use of generative artificial intelligence in a public high school in Mazatlán, México

Entre la verificación y la delegación: el uso de la inteligencia artificial generativa en un instituto público de Mazatlán, México

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ABSTRACT

This article addresses a study conducted at a public upper secondary school of the Universidad Autónoma de Sinaloa in Mazatlán, Mexico, on how students use generative artificial intelligence (AI) in their schoolwork, with the aim of understanding what happens to their autonomy when these tools become part of their academic life. A cross-sectional design was applied through an online questionnaire, which was answered anonymously by 206 students aged 15 to 18 in May 2026. Among the results, it was found that two out of three students (67.5%) use AI at least once a week, with ChatGPT and Gemini as the most commonly used tools, mainly to request explanations of complex topics. It is worth noting that 78.2% report using AI to verify their own answers and only 26.7% acknowledge that they could not complete some tasks without it; however, those who use it daily rely on it to solve mathematics exercises and write essays up to three times more often than the rest of their peers. Based on the above, it can be inferred that there is a gap between the autonomy students claim and the practices they themselves report; therefore, the challenge for teachers, families and institutions lies in teaching the correct and ethical use of these tools, so that AI supports learning rather than replacing the student's own effort.

Keywords: Artificial intelligence, Autonomy, Upper secondary education, Learning

RESUMEN

El presente artículo aborda un estudio realizado en una unidad académica de Nivel Medio Superior de la Universidad Autónoma de Sinaloa, en Mazatlán, sobre el uso que hacen los estudiantes de la inteligencia artificial (IA) generativa en sus tareas escolares, esto con la finalidad de conocer lo que ocurre con su autonomía cuando dichas herramientas forman parte de su vida académica. Se aplicó un diseño transversal mediante un cuestionario en línea, el cual fue respondido de manera anónima por 206 estudiantes de entre 15 y 18 años en mayo de 2026. Entre los resultados se encontró que dos de cada tres estudiantes (67.5 %) utilizan la IA al menos una vez a la semana, siendo ChatGPT y Gemini las herramientas más empleadas, sobre todo para pedir explicaciones de temas complejos. Cabe destacar que el 78.2 % declara utilizar la IA para verificar sus respuestas y solo el 26.7 % reconoce que no podría realizar algunas tareas sin ella; sin embargo, quienes la usan a diario recurren a ella para resolver ejercicios de matemáticas y redactar ensayos hasta tres veces más que el resto de sus compañeros. Con lo anterior, se puede deducir que existe una distancia entre la autonomía que los estudiantes declaran y las prácticas que ellos mismos reportan, por lo que el reto para docentes, familias e instituciones está en enseñar el uso correcto y ético de este tipo de herramientas, de manera que la IA apoye el aprendizaje y no sustituya el esfuerzo del estudiante.

Palabras clave: Inteligencia artificial, Autonomía, Educación media superior, Aprendizaje.

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INTRODUCTION

Generative artificial intelligence, that is, the kind capable of producing texts, images or answers from a written question posed in everyday language, spread through classrooms with surprising speed. While educational television, experiences such as telesecundarias and the Edusat network, or the arrival of computers to schools at various educational levels required years of planning and investment, tools such as ChatGPT became popular among students in a matter of months, all of this starting in late 2022, without any official program mediating or any kind of prior training.

In the specific case of Mexico, the data are beginning to show the magnitude of this phenomenon; a study conducted at the Universidad Nacional Autónoma de México byBenavides-Lara et al. (2025)found that 87 % of the Upper Secondary Level students who responded to their survey had already used some generative AI, mainly to obtain explanations about a topic, search for information and get ideas for completing schoolwork. For its part, UNESCO published a guide in Spanish in 2024 to provide guidance on the use of AI tools in education and research(Miao and Holmes, 2024), which suggests that the issue has ceased to be a technological curiosity and has become a matter related to educational policies.

In light of all of the above, there is a concern among teachers and parents, which consists of what happens when students use this type of technology and about their capacity to learn on their own when they have at hand something that answers almost anything.

DEVELOPMENT

When speaking of autonomy in learning, reference is made to the student's capacity to carry out their own learning process. According toZimmerman (2002), the self-regulated student is one who sets goals, monitors their progress and evaluates the results of their own work, instead of waiting for someone else to do it for them; in this sense, using AI to check whether an exercise was solved correctly can be considered autonomous behavior, whereas asking it to solve the exercise in its entirety comes closer to handing over responsibility.

Likewise, it is necessary to take into account what specialists call cognitive offloading, whichRisko and Gilbert (2016)describe as the use of external resources to reduce the mental effort that a task demands. This is an activity carried out daily, such as when a piece of data is written down instead of memorized, or a list of things to do without the need to remember it, one simply turns to the place where it was stored; it is here that the problem arises of offloading the entire process onto the machine without the student learning how to carry it out on their own.

METHODOLOGY

The research was carried out in an academic unit of Upper Secondary Level (NMS) of the Universidad Autónoma de Sinaloa (UAS), located at the Rodolfo Tuirán Gutiérrez Campus in the city of Mazatlán, Sinaloa. The school has morning, afternoon and evening shifts, with an enrollment of more than 3400 students distributed across 72 groups.

A cross-sectional design was applied, that is, the data was collected at a single time, this in order for the student to capture the usefulness it gives to AI in their school life. To do this, an online questionnaire developed in Google Forms was used, which was answered by 206 students between May 11 and 24, 2026; It should be noted that the form did not request a name or email, so the responses were anonymous, on the other hand, the age range of the students who responded was from 15 to 18 years old and was only applied in the morning and afternoon shifts.

The questionnaire was organized into three sections:

- Frequency and use, with questions about how often they use AI for their schoolwork and which tool they use most.
- Perception of learning, with four statements about understanding of the topics, dependence on AI, verification of their own answers and the time they devote to traditional bibliographic sources.
- Purpose of learning, where students indicated how often (always, sometimes or never) they turn to AI for activities such as explaining concepts, solving mathematics exercises, writing essays or translating texts.

As for the scope of the results, it should be noted that they describe what happens in a particular school community and cannot be generalized to all high schools in the country; even so, they

offer valuable clues about a phenomenon that is very likely to recur in many classrooms in Mexico.

RESULTS

The first finding that stands out is that AI is already part of the academic life of the vast majority of students. Of the 206 young people who responded, only 7 stated that they never use AI; the rest use it with varying frequency: 58 do so daily, 81 weekly and 60 occasionally, which means that two out of three students (67.5 %) turn to it at least once a week.

As for the tools, ChatGPT is the most used (57.8 %), followed by Gemini (28.6 %); at this point it is worth highlighting a situation that some students mentioned: assistants included in applications of daily use, such as the one in WhatsApp, which shows that AI reaches young people through various paths that are not always present at school.

As for purposes, the most common use among students is asking for explanations of complex topics, since 95 out of every 100 students do so always or sometimes; next come solving mathematics exercises (88 %), translating texts (81%) and writing essays or drafts (79 %). From this, it can be stated that for some young people AI acts as an advisor available whenever needed, but also that it plays the role of being able to do any part of the work requested of it.

The perceptions that students have about their own learning reveal a complex relationship with the tool:

·Six out of ten (60.2 %) consider that they understand a topic better when AI explains it to them than when they read a textbook.

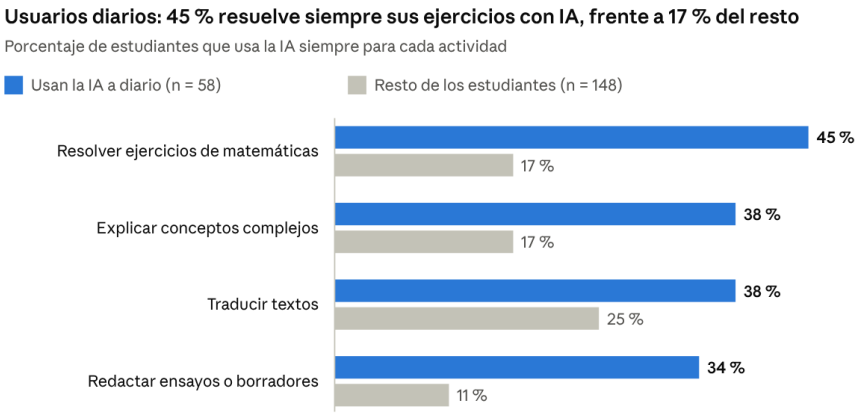
·In a proportion very similar to the previous one (59.7 %), the student acknowledges that they now spend less time researching in traditional bibliographic sources.

·Almost eight in ten (78.2 %) state that they use AI to verify whether their answers are correct, and not to have their tasks done.

·Only one in four students (26.7 %) acknowledges that they could not complete some tasks without access to AI.

At first glance, the results above could be read as good news, since most young people state that they use AI responsibly and few say they depend on it. However, when the answers of those who use this tool are compared with those of the rest of their classmates, a contradiction appears that needs to be examined carefully.

Figure 1. Constant use of AI according to frequency of use.



In the survey of 206 students from the aforementioned high school in May 2026, the “rest” includes weekly, occasional or no use (n = 148), compared with those who use it “daily” (n = 58).

As observed in Figure 1, the 58 students who use AI daily turn to it constantly to solve mathematics exercises and to write essays, with a frequency between two and a half and three times higher than the rest of their classmates; in other words, those who use AI the most are also those who delegate the most tasks to it in which the tool may end up doing the work. Likewise, 76 % of daily users feel they manage to understand better with AI than with a textbook, compared with 40 % of those who hardly use it, and 69 % spend less time on traditional sources, compared with 43 %.

The most interesting thing about all this is that greater use is not reflected in the way students see themselves. Eight in ten young people who attribute an inability to function without

AI also state that they only use it to verify their answers, and although daily users acknowledge a certain dependence (33 % versus 21 % of those who hardly use it), the difference was not statistically significant. From the above, it can be deduced that there is indeed a gap between the autonomy that students declare and the practices they themselves report.

Research findings

The findings obtained in the school analyzed are not an isolated case, since they coincide with various studies conducted in different parts of the world. Below, some contributions are cited for a better understanding of the context of this research, based on the literature.

First,Bastani et al. (2025)conducted a large-scale study in a high school in which mathematics students practiced with the support of GPT-4. While they had access to the tool, students notably improved their performance in the practice sessions; however, when access was withdrawn, the performance of those who had relied on it declined, which the authors interpret as reduced skill acquisition. It should be noted that this negative effect was reduced when the AI was configured to give hints designed by teachers instead of providing the answers.

For their part,Fan et al. (2025)warn about what they call “metacognitive laziness”, which occurs when the student leaves in the hands of AI not only the task but also reflection on their own learning process, that is, they stop asking themselves whether they really understood or what they still need to learn.

Likewise,Gerlich (2025), in a study with 666 participants, found that frequent use of AI tools is associated with lower critical thinking, a relationship largely explained by cognitive offloading, and that younger participants showed greater dependence on these tools. Along the same lines, the systematic review byZhai et al. (2024)concludes that excessive reliance on AI dialogue systems affects capacities such as critical reasoning and decision-making.

In the specific case of upper secondary school,Salas-Canul and Quiñonez-Pech (2026)reviewed studies published between 2020 and 2025 and note that most research has concentrated on higher education, whereas at the Upper Secondary Level the evidence is only beginning to be built; the authors warn that, without institutional frameworks that promote critical AI literacy, there is a risk that students will replace cognitive effort with technological shortcuts.

Based on the above, it can be said that the gap between what the students of the high school analyzed in this study claim and what they report doing, rather than a deception, can be read as a sign that many young people still do not clearly distinguish between relying on AI to learn and letting AI do the work for them.

Recommendations for the classroom and the home

Banning the use of AI in schools does not seem to be a very sound solution, since students coexist with it very frequently and it is part of their student life; what is in the hands of educational authorities is to teach the correct and ethical use of this type of tools, so that the learning obtained within the classroom is strengthened. Based on the results obtained and the contributions of the authors already cited, the following recommendations are made:

For teachers

- Design activities that make the process visible and not only the final product, for example, asking the student to explain aloud how they solved an exercise or to submit a log in which they record what they used AI for.
- Solve part of the exercises within the classroom, where it is possible to observe how the student works and support them with their doubts.
- When AI is used in class, configure it to function as a tutor that gives hints and not as a machine that delivers answers, as suggested by the results ofBastani et al.(2025).

For families

- Talk with young people about how and for what they use AI, beyond asking whether they have already finished the homework.
- Recognize the effort and reasoning behind a piece of work, and not only the grade or on-time submission.

For students

- Try first to solve the exercise on your own and use AI afterwards to check the result, which is

precisely what most say they do.
- Ask the AI for step-by-step explanations and then immediately try to explain the topic in your own words without consulting it again.
- Continue consulting the textbook and other reliable sources, since AI can make mistakes and does not always indicate where it obtains the information.

Finally, institutions need guidelines and critical AI literacy programs, as proposed bySalas-Canul and Quiñonez-Pech (2026), so that these recommendations do not depend solely on the goodwill of each teacher.

CONCLUSIONS

Based on the results of the survey administered to the students of the Academic Unit Preparatoria in question, the following is concluded:

Generative AI is already part of the daily lives of young high school students: two out of three use it at least once a week, and only a very small minority never use it for their tasks.

Most students claim to use AI to verify their answers and few acknowledge being dependent on it; however, those who use it daily turn to it more frequently to solve exercises and write essays, which reveals a gap between the autonomy they declare and the practices they report.

As frequency of use increases, more students feel they learn better with AI than with the textbook and spend less time on traditional bibliographic sources, which is not negative in itself but requires schools to teach how to contrast and verify information.

The challenge for teachers, families and institutions lies in accompanying young people so that they use AI as a support that strengthens their autonomy and not as a substitute for their own effort.

REFERENCES

1. Bastani, H., Bastani, O., Sungu, A., Ge, H., Kabakçı, Ö. y Mariman, R. (2025). Generative AI without guardrails can harm learning: Evidence from high school mathematics. Proceedings of the National Academy of Sciences, 122(26), Artículo e2422633122. https://doi.org/10.1073/pnas.2422633122
2. Benavides-Lara, M. A., Rendón Cazales, V. J., Escalante Rivas, N., Martínez Hernández, A. M. del P. y Sánchez Mendiola, M. (2025). Presencia y uso de la inteligencia artificial generativa en la Universidad Nacional Autónoma de México. Revista Digital Universitaria, 26(1). https://doi.org/10.22201/ceide.16076079e.2025.26.1.10
3. Fan, Y., Tang, L., Le, H., Shen, K., Tan, S., Zhao, Y., Shen, Y., Li, X. y Gašević, D. (2025). Beware of metacognitive laziness: Effects of generative artificial intelligence on learning motivation, processes, and performance. British Journal of Educational Technology, 56(2), 489–530. https://doi.org/10.1111/bjet.13544
4. Gerlich, M. (2025). AI tools in society: Impacts on cognitive offloading and the future of critical thinking. Societies, 15(1), Artículo 6. https://doi.org/10.3390/soc15010006
5. Miao, F. y Holmes, W. (2024). Guía para el uso de IA generativa en educación e investigación. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000389227
6. Risko, E. F. y Gilbert, S. J. (2016). Cognitive offloading. Trends in Cognitive Sciences, 20(9), 676–688. https://doi.org/10.1016/j.tics.2016.07.002
7. Salas-Canul, A. A. y Quiñonez-Pech, S. H. (2026). Uso de la inteligencia artificial generativa en el nivel de bachillerato: una revisión sistemática (2020-2025). Praxis Educativa, 30(1), 1–16. https://doi.org/10.19137/praxiseducativa-2026-300111
8. Zhai, C., Wibowo, S. y Li, L. D. (2024). The effects of over-reliance on AI dialogue systems on students' cognitive abilities: A systematic review. Smart Learning Environments, 11(1), Artículo 28. https://doi.org/10.1186/s40561-024-00316-7
9. Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. Theory Into Practice, 41(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2

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CONFLICT OF INTEREST

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