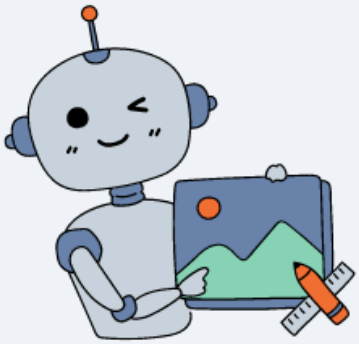
SmartStart Newsletter

Latest news from the SmartStart Teacher Academy



smart start

ERASMUS+

Teacher Academy

Study Insight

Study Insight: The Generative AI Learning Penalty

Maximilian Stark

Research on the impact of Generative AI chatbots on learning is divided: For instance, some papers report that AI use leads to a decrease in critical thinking skills (Choudhuri et al., 2026; Krupp et al., 2024), while others report a potential to increase them (Suriano et al., 2025). Most students use AI in some way, and most of them believe that it is benefitting their academic achievement (Vieriu & Petrea, 2025), whereas neuro-imaging research has provided evidence that AI assistance during studying can decrease learning effectiveness and recall (Kosmyna et al., 2025). To some degree, this heterogeneity in research

We are social!

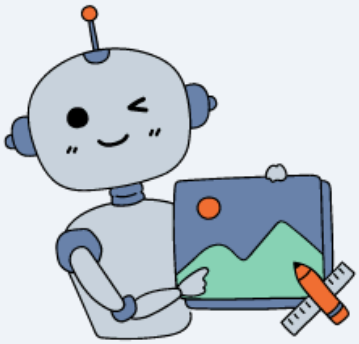
Check out or Social Media Presence on Instagram, Facebook and LinkedIn to stay updated on project insights, teacher training activities, and the latest developments in AI in education. Join the conversation and discover how SmartStart is shaping innovative and responsible teaching practices.

Contact the Project Office
Katholische Universität Eichstätt-Ingolstadt
(Ostenstr. 26)
Temporary address: Hofgarten 1
85072 Eichstätt
Germany

We are social!

SmartStart Newsletter

Latest news from the SmartStart Teacher Academy



smart start

ERASMUS+

Teacher Academy

Study Insight

Study Insight: The Generative AI Learning Penalty

Maximilian Stark

Research on the impact of Generative AI chatbots on learning is divided: For instance, some papers report that AI use leads to a decrease in critical thinking skills (Choudhuri et al., 2026; Krupp et al., 2024), while others report a potential to increase them (Suriano et al., 2025). Most students use AI in some way, and most of them believe that it is benefitting their academic achievement (Vieriu & Petrea, 2025), whereas neuro-imaging research has provided evidence that AI assistance during studying can decrease learning effectiveness and recall (Kosmyna et al., 2025). To some degree, this heterogeneity in research

We are social!

Check out or Social Media Presence on Instagram, Facebook and LinkedIn to stay updated on project insights, teacher training activities, and the latest developments in AI in education. Join the conversation and discover how SmartStart is shaping innovative and responsible teaching practices.

Contact the Project Office
Katholische Universität Eichstätt-Ingolstadt
(Ostenstr. 26)
Temporary address: Hofgarten 1
85072 Eichstätt
Germany

We are social!

results can certainly be attributed to different research designs and different types of AI usage.

A new study on Chinese secondary school students (Strömberg et al., 2026) adds an interesting angle: In a vast sample of over 26,000 students in grades 7 to 12, researchers investigated how students using AI in real life and in their own preferred manner impacted academic achievement. Results are sobering: The longitudinal study, published as a discussion paper for the pan-European Centre for Economic Policy Research, found that AI use overall lowered performance in exams by 20% within just six months. The researchers describe a pattern in which 80% of students outsourced parts of their homework to AI, reducing homework completion time while increasing homework scores. Only one in five students used AI in a way that did not reduce homework completion time, e.g., as a digital tutor or as a search engine replacement. Interestingly, even those students experienced learning losses compared to students who used no AI at all, though these losses were much smaller.

The implication is clear: When allowed to use AI as they see fit, most students currently use these tools to decrease their workload, and in so doing deprive themselves of opportunities to learn. However, even the minority of students who seem to use AI in the way they are "supposed to" display a decrease in learning effectiveness. This would be consistent with Kosmyna et al.'s conclusion that studying with AI assistance often leads to outsourcing the most difficult and frustrating parts of the learning process, leading to shallower cognitive processing. It has long been known that the most difficult parts of a learning task are often the most cognitively important: "[Some] difficulties that elicit more effort and that slow down learning [...] will more than compensate for their inconvenience by making the learning stronger, more precise, and more enduring. Short-term impediments that make for stronger learning have come to be called desirable difficulties" (Brown, 2014, pp. 68–69). Most people use chatbots to make daily tasks more convenient, less time-consuming, and less frustrating. When that daily task is studying, however, this large-scale study demonstrates how that increased convenience can backfire and do lasting harm.

References

Choudhuri, R., Sanchez, C., Burnett, M., & Sarma, A. (2026). *Thinking less, trusting more: GenAI's impacts on students' cognitive habits. arXiv.* https://doi.org/10.48550/ARXIV.2601.22430

Kosmyna, N., Hauptmann, E., Yuan, Y. T., Situ, J., Liao, X.-H., Beresnitzky, A. V., Braunstein, I., & Maes, P. (2025). *Your brain on ChatGPT: Accumulation of cognitive debt when using an AI assistant for essay writing task (arXiv:2506.08872). arXiv.* https://doi.org/10.48550/ARXIV.2506.08872

Krupp, L., Steinert, S., Kiefer-Emmanouilidis, M., Avila, K. E., Lukowicz, P., Kuhn, J., Küchemann, S., & Karolus, J. (2024). Unreflected acceptance – Investigating the negative consequences of ChatGPT-assisted problem solving in physics education. In F. Lorig, J. Tucker, A. Dahlgren Lindström, F. Dignum, P. Murukannaiah, A. Theodorou, & P. Yolum (Eds), *Frontiers in Artificial Intelligence and Applications.* IOS Press. https://doi.org/10.3233/FAIA240195

Contact the Project Office
Katholische Universität Eichstätt-Ingolstadt
(Ostenstr. 26)
Temporary address: Hofgarten 1
85072 Eichstätt
Germany

We are social!

Strömberg, D., Lei, V., & Wu, Y. (2026). *The generative AI learning penalty: Evidence from Chinese secondary education.* SSRN. https://doi.org/10.2139/ssrn.6868618

Suriano, R., Plebe, A., Acciai, A., & Fabio, R. A. (2025). Student interaction with ChatGPT can promote complex critical thinking skills. *Learning and Instruction, 95*, 102011. https://doi.org/10.1016/j.learninstruc.2024.102011

Vieriu, A. M., & Petrea, G. (2025). The impact of artificial intelligence (AI) on students' academic development. *Education Sciences, 15*(3), 343. https://doi.org/10.3390/educsci15030343

AI Technology Corner

AI in the Classroom

Laila Khalil

Imagine a classroom where a vocabulary drill feels like a game show, a science quiz like a race, and a reading exercise like a puzzle to be solved. That is the promise of interactive AI-powered learning AI websites - browser-based platforms that let teachers transform ordinary lesson content into game-based activities without any coding (Sari et al., 2024). Instead of static worksheets, students meet quizzes, matching games, crosswords, and word puzzles that respond instantly to their answers, turning practice into play. This is more than a matter of fun: the research from real classrooms shows that when concepts are delivered through games, students pay closer attention, participate more willingly, and remember more of what they learn. Independent studies report measurable gains in motivation, engagement, and learning outcomes (Purnamasari & Purwandari, 2025), stronger classroom participation and more independent work (Mazelin et al.,2022), improved vocabulary mastery (Jannah & Syafryadin, 2022; Rubykania et al., 2025), and better reading comprehension (Wahid et al., 2025). These games do double duty: they sharpen skills through repeated, low-stakes practice while deepening conceptual understanding because learners receive immediate feedback and can replay an activity until they master a skill. The result is a simple but powerful idea at the heart of modern teaching: when learning feels like play, students keep playing — and keep learning.

Wordwall in the Classroom: What Independent Research Really Shows

What is Wordwall?

Wordwall is a web-based application that lets teachers turn ordinary lesson content into game-based, interactive learning activities (Nufus et al., 2025). It was designed so that educators can create digital learning media **without coding** (Sari et al, 2024), and it works on any device with a browser — there is nothing to download. Teachers simply share a link with students, who can join the activity immediately, and since it is cloud-based, it is accessible any time, from anywhere, and at no cost for the basic account (Zalillah & Alfurqan, 2022). Activities can also be printed or downloaded,



Contact the Project Office
Katholische Universität Eichstätt-Ingolstadt
(Ostenstr. 26)
Temporary address: Hofgarten 1
85072 Eichstätt
Germany

We are social!

so the platform supports both digital and paper-based classrooms.

How teachers use it

Classroom research documents three main uses. First, **in-class games and drills**: teachers project or share an activity to energize a lesson, check understanding, and get immediate participation. Second, **assessment and evaluation**: studies in science, religious education, and language classes used Wordwall as a quiz-based evaluation tool. Third, **homework and personalized tasks**: teachers can assign activities as tasks, and each student's results are recorded and returned to the teacher One notable workflow feature: an activity created in one format can be switched to another template "with one click" — a matching game on shape names can become a crossword, quiz, or word search with the same content, which saves teachers significant preparation time.

The activity library

Wordwall offers a large menu of activity templates. Across the studies reviewed, teachers used: Quiz, Gameshow Quiz, Match Up, Matching Pairs, True or False, Word Search, Missing Word, Group Sort, Random Wheel, Random Cards, Anagram, Unjumble, Open the Box, Maze Chase, Labelled Diagram, Flashcards, Crossword, Flip Tiles, Whack-a-Mole, and Find the Match (Rosmana et al., 2023; Sari et al., 2024). Also, The platform provides around **18 templates free of charge**, covering everything from multiple-choice quizzes with timers and bonuses to puzzles, word games, and picture-labeling tasks in which teachers can insert images or their own photographs (Kazhan & Karpiuk, 2023).

Evidence spans the full school career. Studies about primary/elementary students (Grade 3-5) report Wordwall use with:

- mathematics achievement in third grade (Indrawati et al., 2025),
- plane geometry (Habibah & Arifin, 2026),
- science learning outcomes (Hanaffi et al., 2024; Lestari & Rohmani, 2024);
- vocabulary learning with grades 4–5 EFL learners in Thailand (Anggraini et al., 2025)

A 2025 systematic literature review that screened 81 studies and synthesized 40 empirical articles concluded that Wordwall contributes to increased motivation, learning outcomes, engagement, collaboration, communication, and concept mastery across educational levels (Purnamasari & Purwandari, 2025).

The evidence for benefits

Independent studies report consistent positives, with concrete figures:

- Engagement and enjoyment. In a junior high vocabulary study, 80% of students said Wordwall was more fun than traditional methods (Rubykania et al., 2025). In an ESL classroom survey, 42% of students said it helped them engage more effectively in class, and 46% felt it enabled them to work independently (Mazelin et al., 2022).

Contact the Project Office
Katholische Universität Eichstätt-Ingolstadt
(Ostenstr. 26)
Temporary address: Hofgarten 1
85072 Eichstätt
Germany

We are social!

- Learning outcomes. A quasi-experimental third-grade math study found the Wordwall class averaged 89.60 versus 83.33 for the control group ($p = 0.013$) (Indrawati et al., 2025). Wordwall groups showed significantly higher post-test scores in literary comprehension and significant writing-skill gains (Wahid et al., 2025).
- Memory and retention. 75% of students reported improved vocabulary recall (Rubykania et al., 2025), and learners said the games helped them remember words more easily (Anggraini et al., 2025).
- Immediate feedback and confidence. Students valued clear instructions (50%), instant answers after finishing a quiz (54%), and the leaderboard feature that let them check their scores (46%) (Mazelin et al., 2022). The competitive, team-based format was repeatedly described as exciting, interesting, and motivating.

The reported drawbacks

The research is equally candid about limitations:

- Free-account restrictions. Free users are limited (one study notes a cap of 5 created resources per teacher, with printables excluded), and a premium subscription is required for unlimited activities.
- Internet dependence. Wordwall runs through a connection; connectivity problems can disrupt lessons, and teachers cannot control technical failures on students' devices.
- Design limitations. The font size cannot be changed and the available colors are limited (Sari et al., 2024).
- Pedagogical limits. One ESP study found the app provides no space for students to explain their correct or incorrect answers, limiting deeper discussion (Sa'diyah, 2022).
- Implementation barriers. Device shortages, unfamiliarity with digital platforms, and the need for training were recurring challenges in school settings (Fonna & Adani, 2025).

A note on privacy and student data

Any digital platform — including AI-assisted and gamified learning tools — may collect data on who uses it and how. Education researchers warn that schools, teachers, and students often become "passive data suppliers," with learning data controlled by third-party platforms rather than by the institutions themselves (Huang, 2023). A lack of transparency in some apps' privacy policies can allow third parties to build detailed profiles of students, including for behavioral advertising (Zimmerle, 2021). Platforms may also monitor activity in ways that raise questions under laws like FERPA (Creel & Dixit, 2022), and AI-integrated educational systems in particular depend on collecting large amounts of personal student information (Imohimi, 2025).

For classrooms, the practical guidance from this research is straightforward:

- **Never enter students' real names, birth dates, or other identifying details** into platforms — use class codes, nicknames, or teacher-created IDs.

Contact the Project Office
Katholische Universität Eichstätt-Ingolstadt
(Ostenstr. 26)
Temporary address: Hofgarten 1
85072 Eichstätt
Germany

- **Do not paste personal or sensitive information** into any AI-powered tool; treat submitted content as potentially reviewable or reusable by the platform.
- **Review privacy policies before adoption**, and prefer platforms vetted by your institution (Zimmerle, 2021).
- **Ask what happens to the data** — where it is stored, who has access, and whether it is used for advertising or model training — before making a platform a classroom staple (Huang, 2023).

Last words about Wordwall

Across more than a dozen independent classroom studies, the picture is consistent: Wordwall is a flexible, low-barrier tool that measurably lifts engagement, motivation, and learning outcomes from primary school to university — provided teachers work around its free-tier limits, connectivity requirements, and privacy considerations.

References

Anggraini, R., Megawati, F., Agustina, S., Thongbab, S., & Asmara, C. H. (2025). EFL Learners' Perceptions on Wordwall Implementation in Learning Vocabulary. *JET ADI BUANA*, *10*(2), 179–189. https://doi.org/10.36456/jet.v10.n02.2025.10686

Creel, K., & Dixit, T. (2022). *Privacy and Paternalism: The Ethics of Student Data Collection*. https://doi.org/10.21428/2c646de5.b725319a

Fonna, F., & Adani, S. (2025). Wordwall in the classroom: A qualitative study of student-teacher perspectives. *Journal of Research in Instructional*, *5*(2), 640–655. https://doi.org/10.30862/jri.v5i2.738

Habibah, E. U., & Arifin, Moch. B. U. B. (2026). The Wordwall Supported Mathematics Achievement in Elementary School Classrooms. *Academia Open*, *10*(1). https://doi.org/10.21070/acopen.10.2025.12640

Hanafi, H., Andayani, A., & Prabowo, S. (2024). Analysis of the Implementation of Wordwall Learning Media in Improving Elementary School Students' Science Learning Outcomes. *Jurnal Pendidikan Sekolah Dasar.*, *5*(1), 46–54. https://doi.org/10.37366/jpgsd.v5i01.4683

Huang, L. (2023). Ethics of Artificial Intelligence in Education: Student Privacy and Data Protection. *Science Insights Education Frontiers*, *16*(2), 2577–2587. https://doi.org/10.15354/sief.23.re202

Imohimi, E. O. (2025). Building Privacy and Preserving AI Models for Secure Student Data Management in Educational Technology Platforms. *Journal of Intelligent Learning Systems and Applications*, *17*(3), 149–171. https://doi.org/10.4236/jilsa.2025.173011

Indrawati, T., Trisniawati, T., Hadi, W., Nisa, A. F., & Khosiyono, B. H. C. (2025). The Influence of Wordwall Learning Media on Improving Students' Mathematics Learning Outcomes in Elementary Schools. *IndoMath Indonesia Mathematics Education*, *8*(2), 55. https://doi.org/10.30738/indomath.v8i2.139

Jannah, M., & Syafryadin, S. (2022). EFL students' perspectives on the use of Wordwall.net as vocabulary learning media. *ELT Forum Journal of English Language Teaching*, *11*(2), 115–124. https://doi.org/10.15294/elt.v11i2.57120

Kazhan, Y., & Karpiuk, V. A. (2023). Enhancing German language learning through interactive tools. *CTE Workshop Proceedings*, *11*, 15–28. https://doi.org/10.55056/cte.596

Contact the Project Office
Katholische Universität Eichstätt-Ingolstadt
(Ostenstr. 26)
Temporary address: Hofgarten 1
85072 Eichstätt
Germany

We are social!

Lestari, R., & Rohmani, R. (2024). Analysis of the Effectiveness of Wordwall Media Use on Science Learning Outcomes in Elementary Schools. *IJORER International Journal of Recent Educational Research*, *5*(4), 891–905. https://doi.org/10.46245/ijorer.v5i4.634

Mazelin, N., Maniam, M., Jeyaraja, S. S. B., Ng, M. M., Xiaoqi, Z., & Jingjing, Z. (2022). Using Wordwall to Improve Students' Engagement in ESL Classroom. *International Journal of Asian Social Science*, *12*(8), 273–280. https://doi.org/10.55493/5007.v12i8.4558

Nufus, Z., Suparmanto, S., Rohim, A., Pebriarianti, D., & Gunawan, B. A. Z. (2025). Pelatihan Evaluasi Siswa Dalam Pembelajaran Bahasa Arab Melalui Quiz Wordwall Di Madrasah Aliyah Assullamy Langko. *Armala*, *5*(2), 86–99. https://doi.org/10.24260/armala.v5i2.2991

Purnamasari, D., & Purwandari, R. D. (2025). The Role of Wordwall in Improving Interactive Learning Quality: An Analisis of Empirical Studies through Systematic Literature Review. *Proceedings Series on Social Sciences & Humanities*, *25*, 168–174. https://doi.org/10.30595/pssh.v25i.1684

Rosmana, P. S., Iskandar, S., Sari, A. N., Kholida, A., Firdaus, D. N., & Trisnawati, P. (2023). Penggunaan Media Wordwall sebagai Evaluasi Pembelajaran Organ Pernapasan pada Hewan Kelas V di SDN 3 Nagri Kaler. *Journal on Education*, *5*(2), 1965–1973. https://doi.org/10.31004/joe.v5i2.838

Rubykania, R., Hidayat, S., & Rusdiyani, I. (2025). Enhancing Vocabulary Mastery and Motivation Using Wordwall Games: Implications for Junior High Education. *Tarbawi Jurnal Keilmuan Manajemen Pendidikan*, *11*(1), 111–120. https://doi.org/10.32678/tarbawi.v11i01.11015

Sa'diyah, I. H. (2022). Embracing technology in ESP classes: Is it a learning tool or just a cool toy? *Academic Journal Perspective Education Language and Literature*, *10*(2), 139–146. https://doi.org/10.33603/perspective.v10i2.7260

Sari, Y., Marini, A., Rahmawati, Y., Fitriasari, E., Wardhani, P. A., Safitr, D., Dewiyani, L., & Muda, I. (2024). Emerging Technologies of Interactive Learning Media with Wordwall for Students' Interest as an Impact on SDGS. *Journal of Lifestyle and SDGs Review*, *5*(2). https://doi.org/10.47172/2965-730x.sdgsreview.v5.n02.pe03268

Sukirman, S., & Kholis, M. N. (2026). Student Preferences and Rationales for Five Wordwall Game Formats in Arabic Vocabulary Learning. *ALSINATUNA*, *11*(1), 93–109. https://doi.org/10.28918/alsinatuna.v11i1.12911

Ulya, E. Z., Ma'mun, N., & Dewi, N. M. (2025). Students' perceptions of vocabulary recall and engagement in Wordwall-based gamified learning. *Celtic A Journal of Culture English Language Teaching Literature and Linguistics*, *12*(2), 972–989. https://doi.org/10.22219/celtic.v12i2.42806

Wahid, N. A., Farhan, F., & Wijaya, M. (2025). The role of interactive gamification through Wordwall Apps to improve students' engagement and literary comprehension. *Lingua Technica Journal of Digital Literary Studies*, *1*(1), 38–50. https://doi.org/10.64595/lingtech.v1i1.21

Zalillah, D., & Alfurqan, A. (2022). Penggunaan Game Interaktif Wordwall dalam Evaluasi Mata Pelajaran Pendidikan Agama Islam di SDN 17 Gurun Laweh Padang. *MANAZHIM*, *4*(2), 491–504. https://doi.org/10.36088/manazhim.v4i2.1996

Zimmerle, J. C. (2021). Safe, Sound, and Private: Promoting Data Protection for Students. *Computers in the Schools*, *38*(1), 1–18. https://doi.org/10.1080/07380569.2021.1882203

Contact the Project Office
Katholische Universität Eichstätt-Ingolstadt
(Ostenstr. 26)
Temporary address: Hofgarten 1
85072 Eichstätt
Germany