The power of active student engagement

The role of student engagement in effective learning strategies and its impact on students' future success

Education Perfect

Contents

Introduction

Student engagement plays a pivotal role in effective learning. Moreover, student engagement correlates with their motivation to learn and their commitment to completing their education (Archambault et al., 2009). Additionally, students who exhibit engagement in their learning have better prospects for long-term career opportunities (Cents-Boonstra et al., 2020). Given the critical role of student engagement in both current and future academic success, fostering this engagement becomes critical.

In contemporary education, academic boredom can have serious negative consequences for students' school-based learning (Özerk, 2020). The challenge of engaging students extends beyond merely disseminating information; it revolves around cultivating a genuine passion for knowledge, encouraging critical thinking, and fostering an intrinsic curiosity for learning (Hulme, Green and Ladd, 2013).

Addressing the shortcomings of traditional education involves a shift towards dynamic and engaging learning experiences that recognize and support each student's unique learning journey. The goal is to create an environment where students actively participate in and take ownership of their learning. When students have clarity and input on what and how they learn, they become invested in the process. Personalized learning paths and opportunities for self-assessment help students see their progress and understand their strengths and areas for improvement. This sense of autonomy and responsibility can lead to increased motivation, curiosity, and enthusiasm for learning.

The effect of online learning on student engagement

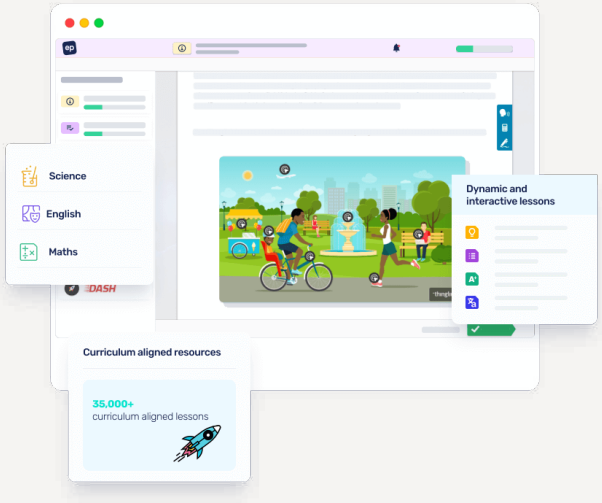
Online learning is one of the greatest revolutions in the history of education, and the effective use of educational technology allows students and teachers to harness the power of this medium to create better student outcomes.

Research by Means et al. for the US Department of Education and Center for Technology in Learning saw a meta-analysis conducted exploring the effects of online instruction. It provides fascinating insights into the benefits of technology when used as part of a cohesive and planned whole classroom approach. The research determined that "online learning can be enhanced by giving learners control of their interactions with media and prompting learner reflection." The meta-analysis suggests that technology can open up new opportunities for learners by supporting personalized learning experiences, immediate feedback, and access to resources and tools that may not be available in purely face-to-face environments

John Hattie's seminal work, Visible Learning (2008), is one of the most respected works in educational research. He presents a large-scale meta-analysis of over 100,000 studies in education and identifies which factors have the greatest effect on improving student outcomes. Hattie's meta-analysis resulted in observable and measurable interventions that could be ranked according to their 'effect size', a quantifiable way to measure the impact of each approach on student outcomes. Education Perfect (EP) incorporates many of the most effective factors, including explicit teaching strategies, differentiation, feedback and spaced repetition throughout its digital learning platform. We will explore each of these in more depth below.

Further, many of the factors from Hattie's research also relate to and contribute to student engagement. Some of his most recent findings focus on the role of technology. In the 2023 sequel to Visible Learning, Hattie could call on data from the intervening 15 years. The impact of technology in education has, of course, made great advances in that time. Hattie identified new technological factors that improve students' performance:

- computer tutoring that provides immediate feedback, particularly when using artificial intelligence
- "flipped learning", whereby students are given the content to learn before coming to class
- the value of technology for its ability to offer diverse, personalized, and engaging learning experiences that cater to various learning styles and needs



Education Perfect is a platform that is intentionally designed to leverage current research and a range of proven pedagogical approaches that improve student engagement and outcomes. This approach includes presenting engaging and adaptive resources to students alongside actionable data insights that create a solid basis for formative assessment. EP's learner experience is designed to consider this research and offers a way to consistently and effectively improve engagement and learning across these key areas. Here is an overview of how EP addresses some of these key areas.

1. Explicit instruction

Archer and Hughes's work on explicit instruction describes a style of learning that is engaging, systemic, direct, and intended to be both practical and easy to implement. They define explicit instruction as being;

> "[C]haracterised by a series of supports or scaffolds, whereby students are guided through the learning process with clear statements about the purpose and rationale for learning the new skill, clear explanations and demonstrations of the instructional target, and supported practice with feedback until independent mastery has been achieved."

"[C]haracterised by a series of supports or scaffolds, whereby students are guided through the learning process with clear statements about the purpose and rationale for learning the new skill, clear explanations and demonstrations of the instructional target, and supported practice with feedback until independent mastery has been achieved."

EP lessons also incorporate many of the exciting findings from the ever-evolving 'Science of Learning', namely how the fields of neuroscience, cognitive psychology and education converge. Teachers can quickly gauge students' pre-existing knowledge through EP's Assessment tools with pre and post-assessment functionality. Cognitive science suggests that if prior knowledge is not available, it needs to be taught. EP's tools can give teachers insight into each student and suggest the next steps in learning so students can make 'meaningful connections' between prior knowledge and new concepts.

EP lessons begin with a clear introduction and learning intentions to make clear to students what they will be learning and what they are expected to know by the end. New information is presented in small 'chunks' (in line with findings on cognitive loading), with supporting images, audio or videos to ensure it is presented using multiple representations. Worked examples are used extensively and are followed by carefully scaffolded questions for students to complete. These are automatically asessed and presented with model answers and clear explanations. Once a set of information and questions has been mastered, new material is introduced, and the process is repeated, with careful interleaving of information, examples, questioning and feedback throughout the lesson.

By the end of a lesson, a student has progressed from carefully guided questioning to independent practice and the opportunity to apply their new knowledge and skills to extended thinking tasks. Finally, lessons conclude with a review of what has been learned and a recap of the original learning intentions.

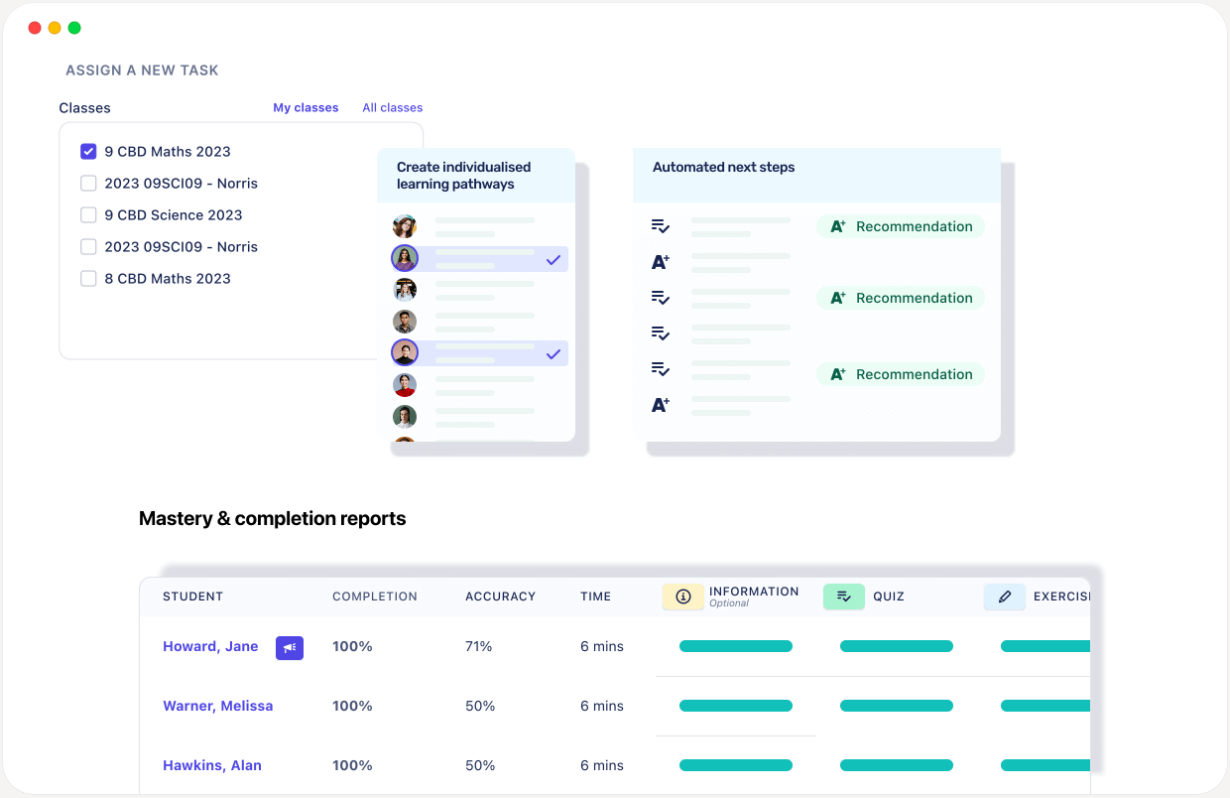
Throughout the Content Library, lessons will also incorporate a range of interactive tools that help to improve the engagement of students with the lesson. These include Desmos and ThingLink interactives.

desmos

Desmos is an advanced platform that offers interactive digital graphing and calculator tools. It integrates with EP and is available within existing lessons in our Content Library and when building custom content.

thinglink.

ThingLink is an award-winning education technology platform that makes it easy to augment images, videos, and virtual tours with additional information and links. Instructional designers use ThingLink to create accessible, visual learning experiences in the cloud. The power of ThingLink is in its ability to pull in so many forms of rich media into one place, helping to minimise students' cognitive load. It is also used to add vocal prompts, images within videos, and more, and therefore maximise student engagement and achievement.



2. Differentiation

In any given classroom,

> "[t]he variation in students' current attainment levels is often large, [and] this can require teachers to teach across five or more curriculum grade levels in a single classroom."

The requirement to differentiate to such an extent places a huge demand on teachers' time to plan, implement, and evaluate different programmes and differentiation strategies. Given these diverse requirements, educators struggle to have enough time to tailor resources to meet the diverse needs of their students and to ensure those students are engaged and challenged. Differentiation is a key factor in engaging students.

EP provides several efficient methods for targeting learning material to individual student needs.

Teachers can assign lessons to different groups or individuals within a class and can easily assign specific sections of lessons to target specific skills

Teachers can also customise resources or create their own using EP's integrated content editing features, providing further tailoring to meet the unique needs of their students

By using the same platform, learners who are not yet meeting the learning targets do not feel self-conscious and are able to learn at their own pace.

In addition to tailoring and targeting learning material, teachers can use EP's assessment functionality to identify students' prior learning and strengths and weaknesses. This feature can automatically generate recommended next steps to create a unique learning pathway for each student.

3. Culturally-responsive and relational pedagogy

Online technology also has the ability to amplify voices that have been traditionally silenced in Western education systems. Russell Bishop's research with Mere Berryman in 'Te Kotahitanga' (2001) began with Māori in Aotearoa New Zealand and more recently extended to include Indigenous

communities in Australia and Canada in Teaching to the North-East (2019). TIn his research, Bishop emphasises the critical importance of relationship-based learning - the primacy of teacher-student school-community relationships. Bishop also states that students' prior knowledge and worldviews must be visible and valued in classrooms. This also includes the many diverse cultures outside of Indigenous communities. In Canada there are over 450 recognized cultures so our education system and tools need to provide opportunities for all students to access and learn. If students are to be engaged, they must be able to recognise themselves and their communities in their learning environments.

Of course, the increasing demand for Indigenous languages and ways of knowing in curricula, often coupled with a lack of system-wide support, puts further pressure on a predominantly non-Indigenous teaching force, many of whom have had little or no exposure to such learning in their own education. Education Perfect has worked hard to build relationships and trust with Indigenous teachers and experts to ensure that their knowledge and perspectives are shared with care and authenticity in recentHistory, Science, English and Mathematics projects across Australia, Canada and Aotearoa New Zealand.

Languages, in particular, are considered central to student well-being and engagement: The Rt Hon. William Aupito Sio said, "The cornerstone of our Pacific cultures, identities and place in Aotearoa, New Zealand are our Pacific languages. They are at the heart of our wellbeing." In the case of languages in decline, where there is a dire lack of qualified teachers and expertise, online technology can support revitalisation efforts. Education Perfect's Beginners' Samoan is such an example and has provided the first opportunity for many students to see and hear their native tongue in a classroom.

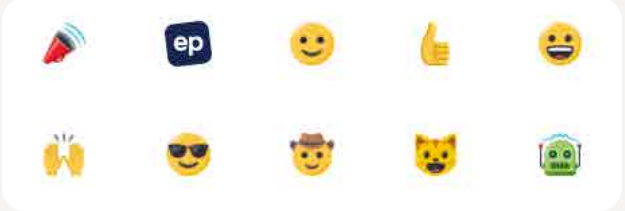
While Education Perfect includes text-to-speech functionality to aid students with specific learning needs in the English language, we are also currently exploring multi-language support within the platform.

4. Gamification

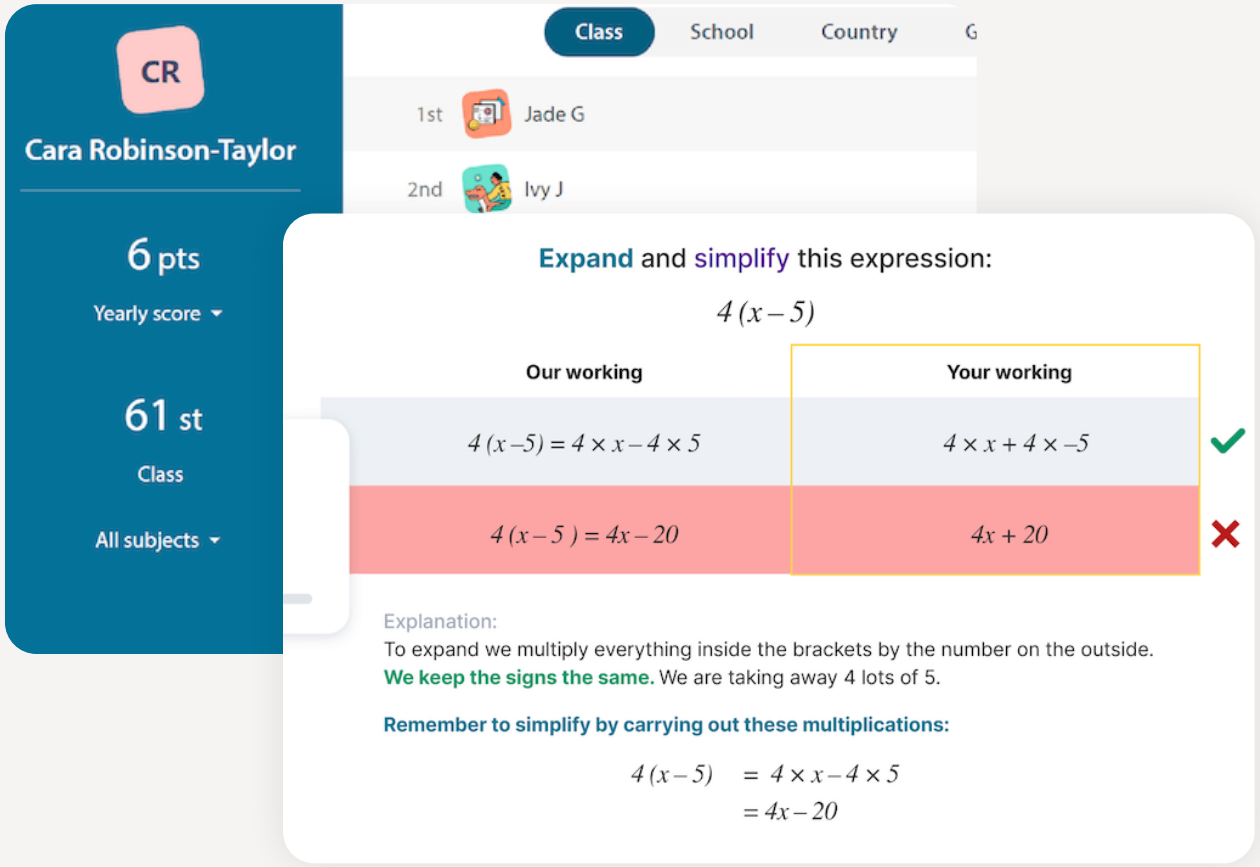
Students learn differently according to their disposition, preference, and pre-existing knowledge. Gamification is a methodology that offers the ability to optimise student learning and provide repetition in an engaging environment.

EP has a variety of gamification elements that are designed to enhance student engagement and persistence. Every question answered correctly earns students a point, contributing to their annual score and placing them on a scoreboard alongside their classmates and school. These points are directly tied to effort rather than performance, giving students of all ability levels a chance to engage actively. The points system is further utilised in annual competitions for each subject, where students compete with other students worldwide to earn certificates, badges and other prizes.

The Dash game is unlocked once a lesson is completed and provides a fast-paced, competitive review of the material in the lesson. This harnesses a number of gamified elements, including peer competition, time-trials, high scores and leaderboards. A balance of speed and accuracy is rewarded, leading to both an engaging but also highly effective tool for consolidating learning.



Students can earn a range of stickers by completing EP lessons. These stickers can be collected in their sticker collection and sent to other students as encouragement. Teachers can award additional stickers to students to reward or motivate reasonable



effort. In addition to the points, Dash and stickers features, EP utilises engaging avatars and backgrounds to enable students to personalise their learning experience.

As we are always on a journey to continuously improve our product, we are exploring other ways to further enhance the gamification aspects of the platform. We are exploring including additional incentives for students, adding a wider variety of learning games, increasing collaboration and interaction between students and further personalising the learning environment for students. We are also currently undertaking a survey of some of our students to discover what they think are the most important factors in their learning and engagement. The results of this survey will be used to inform further development in this area.

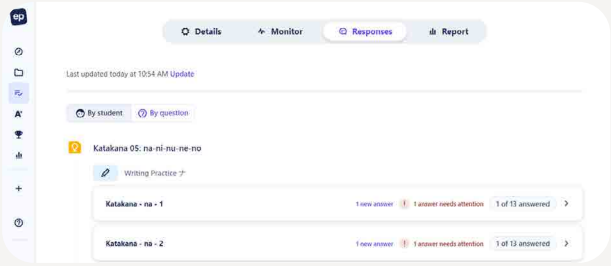
5. Timely and specific feedback

Hattie's research has empirically demonstrated that feedback is one of the most powerful tools available to educators. However, to be effective, it must be both specific and timely. Dylan Wiliam's research demonstrated significantly higher results were observed when students received feedback with recommended next steps rather than a simple level of achievement. This feedback needs to be directly connected to learning targets/outcomes in order to be relevant and applicable but not instant so that failure, and thus learning, does not occur.

Feedback that is timely and specific has been proven to positively impact student learning and engagement. The EP platform provides ongoing and actionable feedback to students in various ways. As students progress through a lesson, many questions are automatically assessed with model answers provided, allowing for continuous feedback as they move through the learning. This ensures students progress to mastery at a pace and level of guidance that suits each individual.

Lessons also contain extended response questions that require more involved student answers and which are not automatically assessed. Model answers and assessment criteria are provided, and students review their responses and can use the provided suggestions to improve. Teachers can view and provide feedback on these extended response questions via text or recorded verbal feedback. Additionally, these feedback features are

available for use in EP's unique peer review feature, an anonymous, teacher-mediated student-to-student feedback tool. The ability to interact with other students in this way further increases student engagement and aso equips students with the tools and strategies to better self-assess.



The Education Perfect platform continues to evolve, after many months of iterative development and improvement, closely informed by feedback from teachers and students, we're excited to share the first instalment of our vision of an AI Learning Companion which will eventually aid the student on every step of their learning journey.

Our learning companion is driven by an inference system deeply grounded in curriculum and lesson content, with a Large Language Model (LLM) at its core. Today it provides personalised, timely feedback to students as they're answering questions in Science, English, History, Geography and Languages.

The possibilities for future development in this space are endless - from providing deeper insights to teachers about common misconceptions to further supporting students as they engage with new concepts and ideas with clarifying information. We are actively exploring how to bring the most meaningful, human-centred, accessible, impactful ideas to classrooms at scale.

6. Spaced repetition

Rosenshine's work on spaced repetition reinforces the need for continuous practice to develop not only skills but also as a knowledge base. Knowledge must be continually rehearsed, summarised, accessed, and applied—and that process must take place over time. He argues that

> ".. the more one rehearses and reviews information, the stronger the interconnections between the materials become."

The review also helps students develop their new knowledge into patterns and acquire the ability to recall past learning automatically.

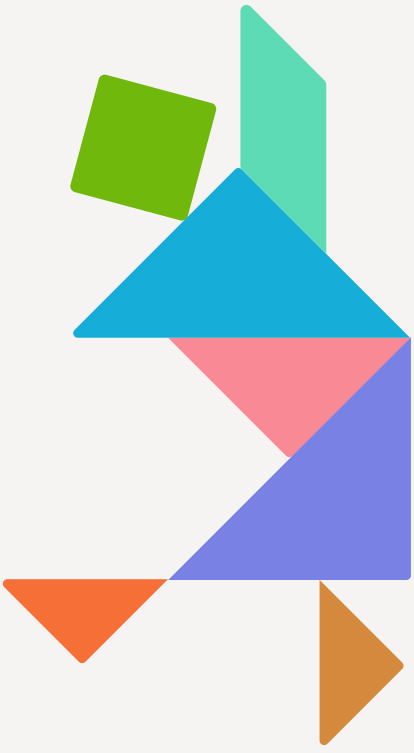
EP has a range of features that encourage the spaced review of learning material in an engaging environment. Points are awarded for each correct answer to automatically assessed questions within lessons, with an additional point per question available at the following intervals: one day, one week, one month, three months, and six months.

In addition to the points system for all learning material, the Dash revision game and our vocabulary and spelling lists have a star-based rewards system, further encouraging students to revisit and revise the material. This helps to build student retention and fluency with the information and skills, providing them with the necessary building blocks for further learning.

Conclusion

Engagement is critical to improving student learning outcomes. Traditional teaching methods can often rely heavily on rote memorisation and standardised assessments. While these have their place, reliance can contribute to disengagement. The one-size-fits-all approach to education, with its emphasis on the passive absorption of information, may fail to inspire a true understanding or intellectual curiosity. Consequently, students may perceive certain subjects as tedious and lacking relevance to their daily lives or future aspirations (Sanchez, 2023).

Quality EdTech, informed by research and data, allows teachers to create engaging learning opportunities for the modern classroom and its increasingly diverse range of student needs. Education Perfect stands out as a comprehensive platform that aligns with Hattie's research on impactful educational practices. By incorporating explicit instruction, differentiation, culturally-responsive lessons, accessible experiences, gamification, timely feedback and spaced repetition not only does EP enhance engagement but also fosters a deeper understanding and love for learning. Through its adaptive resources and actionable data insights, EP empowers teachers to create personalized and dynamic learning experiences that are relevant to students and address their diverse needs, leading to improved learning outcomes for all.



Bibliography

Archambault, I., Janosz, M., Fallu, J.-S. & Pagani, L.S. (2009). Student engagement and its relationship with early high school dropout. Journal of Adolescence, 32(3), pp.651–670. doi:https://doi.org/10.1016/j.adolescence.2008.06.007.

Archer, Anita L., and Charles A. Hughes. Explicit Instruction: Effective and Efficient Teaching. New York: Guilford Press, 2011.

Bishop, R., & Berryman, M. (2009). The Te Kotahitanga Effective Teaching Profile. Set: Research Information for Teachers, 2, 27–34. https://doi.org/10.18296/set.0461.

Bishop, R. Teaching to the North-East: Relationship-based learning in practice. New Zealand: NZCER Press. 2019.

Cents-Boonstra, M., Lichtwarck-Aschoff, A., Denessen, E., Aelterman, N., & Haerens, L. (2020). Fostering student engagement with motivating teaching: An observation study of teacher and student behaviours. Research Papers in Education, 36(6), 754–779. https://doi.org/10.1080/02671522.2020.1767184.

Hattie, J. (2023). Education expert John Hattie's new book draws on more than 130,000 studies to find out what helps students learn. The Conversation. Available at: https://theconversation.com/education-expert-john-hatties-new-book-draws-on-more-than-130-000-studies-to-find-out-what-helps-students-learn-201952 (Accessed 19 March 2024).

Hattie, J. Visible Learning for Teachers: Maximising Impact on Learning. London: Routledge, 2019.

Hulme, E., Green, D.T. & Ladd, K.S. (2013). Fostering Student Engagement by Cultivating Curiosity. New Directions for Student Services, 2013(143), pp.53–64. doi:https://doi.org/10.1002/ss.20060.

Hunter, J., Sonnemann, J., & Joiner, R. "Making Time for Great Teaching: How Better Government Policy Can Help - Grattan Institute Report." Grattan Institute, February 15, 2022. https://grattan.edu.au/report/making-time-for-greatteaching-how-better-government-policy-can-help/.

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. "Evaluation of Evidence-Based Practices in Online Learning." https://www2.ed.gov/rschstat/eval/tech/evidence-basedpractices/finalreport.pdf (Accessed September 16, 2022).

Özerk, G. (2020). Academic Boredom: An Underestimated Challenge in Schools. International Electronic Journal of Elementary Education, 13(1), pp.117–125. doi:https://doi.org/10.26822/iejee.2020.177.

Rosenshine, Barak. "Principles of Instruction." American Federation of Teachers, September 10, 2020. https://www.aft.org/periodical/american-educator/spring-2012/principles-instruction.

Sanchez, M. (2023). Why Is School So Boring? A Comprehensive Look At The Reasons Behind Classroom Tedium. Save Our Schools. Available at: https://www.saveourschoolsmarch.org/why-is-school-so-boring/ (Accessed 24 Jan. 2024).

Smiderle, Rodrigo, Sandro José Rigo, Leonardo B. Marques, Jorge Arthur Peçanha de Miranda Coelho, and Patricia A. Jaques. "The Impact of Gamification on Students' Learning, Engagement and Behavior Based on Their Personality Traits." Smart Learning Environments 7, no. 1 (2020). https://doi.org/10.1186/s40561-019-0098-x.

Get in touch

educationperfect.com
educationperfect
epforlearning
educationperfect
educationperfect

Education Perfect