

Issue 021



Centre for Mathematics, Science
and Technology Education in
Africa (CEMASTE)

CEMASTE INFO

Newsletter

Using AI to Support STEM Education



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Welcome to the 21st Issue of the CEMASTEА Info Newsletter.

We sincerely thank you for your continued readership and support as we highlight CEMASTEА's recent milestones and engagements across the continent.

This edition showcases our ongoing commitment to promoting excellence in STEMI (Science, Technology, Engineering, Mathematics, and Innovation) education in Africa. A significant highlight of this issue is the successful hosting of a landmark international webinar in June 2025, themed *“Advancing STEMI Education in Africa: Policies, Diversity, Artificial Intelligence (AI), and Collaboration.”*

The three-day virtual event brought together stakeholders from 16 African countries and beyond, including educators, policymakers, researchers, and development partners. It provided a dynamic platform for dialogue, reflection, and reimagining the future of STEMI education on the continent. The conversations reaffirmed the importance of collective effort in building inclusive, resilient, and future-oriented STEMI ecosystems, particularly in the face of emerging technologies such as artificial intelligence.

Beyond the webinar, CEMASTEА remained steadfast in its mission to support teacher development, curriculum implementation, and policy influence through several impactful initiatives this quarter.

These efforts reinforce our continued dedication to strengthening capacity, nurturing innovation, and ensuring that no learner or educator is left behind in Africa's educational transformation.

We hope you find this issue both inspiring and informative.

Table of Contents

Editorial	2
Message from the CEO	4
International Webinar on STEMI Education and Emerging Technologies in Africa: The Place of Artificial Intelligence in Pedagogy	5
The 2025 STEM TASTIC Adventures! African Symposium	6
Empowering JS Teachers on ICT Integration	7
Empowering Quality Assurance Officers to Champion STEM Implementation	8
Multi-Sectoral Conference Puts Research & Innovation in Focus	9
Unlocking the Potential of Young Learners in Science and Technology	10
Reclaiming Wellness from Inside Out: A Glimpse into a Wellness Session at CEMASTEA	11
PICTURE SPEAK	12
FABLE: Necessity is the Mother of Invention	13
Crossword	14
BOOK REVIEW: The learning brain: Lessons for education	15



Capturing moments during a STEM Outreach. Follow the links to explore key highlights from our quarterly STEM media coverage—capturing innovation, progress, and powerful moments that shaped our journey.

- <https://youtu.be/nxisyiHh3Zw?si=u39XD3DjiDW3MxuV>
- <https://youtu.be/Q9oGm9pJnd8?si=E16BHUmThkVPsOTo>
- <https://t.co/2vHyJfBWGu>
- <https://youtu.be/ZtgwbXzUTXk?si=GRFvIx6DpZwHTK82>

Message from the CEO



There is growing consensus among education leaders across Africa: “Transforming STEMI education into a resilient, inclusive, and future-ready system will require coordinated efforts and sustained dialogue.” This shared vision took center stage during the recent international held virtually from 10th to 12th June 2025.

The webinar, organized in partnership with key stakeholders, offered a timely opportunity for meaningful dialogue, shared learning and the

strengthening of strategic collaborations.

It brought together a vibrant and diverse community of educators, policymakers, researchers, innovators, and development partners from 16 African countries and numerous organizations across the continent and beyond, all united by a shared commitment to transforming STEMI (Science, Technology, Engineering, Mathematics, and Innovation) education.

At the heart of the discussions was the urgent call to rethink how STEMI education is delivered. Thought leaders and policymakers underscored the need for harmonized, well-funded, and future-oriented STEMI policies that prioritize innovation, teacher professional development, and integration of AI in curriculum design and delivery. The webinar also emphasized inclusive approaches that consider gender, socio-economic disparities, and marginalized groups to ensure equitable access to quality STEMI education across Africa.

In addition, discussions also explored the promise of AI in revolutionizing teaching and learning. From personalizing learning experiences and improving instructional delivery to enhancing system-level efficiency, the discussions also tackled critical issues around ethics, digital inclusion, and the responsible use of technology in education. The forum further highlighted the need for stronger continental and global partnerships among governments, academia, private sector and civil society to scale up innovations and share best practices.

Throughout the sessions, participants engaged in rich exchanges of ideas, shared research findings, and showcased innovations that transform classrooms and educational experiences. CEMASTEА reaffirmed its commitment to and support for capacity building, policy support, and promoting teacher-led innovations that respond to 21st-century learning demands.

We extend our heartfelt appreciation to all our partners and participants for their valuable contributions. We look forward to continued engagement as we work together to shape the future of STEMI education across the continent.



Jacinta L. Akatsa, HSC
CEO, CEMASTEА

International Webinar on STEMI Education and Emerging Technologies in Africa: The Place of Artificial Intelligence in Pedagogy

By Dr. MSichangi and Partnerships committee



CEMASTEА successfully concluded a three-day International Webinar on STEMI Education under the theme "**Advancing STEMI Education in Africa: Policies, Diversity, Artificial Intelligence and Collaboration**". The webinar held on 10th - 12th June, 2025, brought together 258 education stakeholders from 16 African countries, namely Benin, DR Congo, Côte d'Ivoire, Eswatini, Ethiopia, The Gambia, Kenya, Lesotho, Liberia, Malawi, Namibia, Nigeria, Senegal, South Sudan, Uganda and Zambia.

The webinar featured two-hour daily sessions on evidence-based policies and emerging technologies in African STEMI education, integrating diversity and inclusion in STEMI education, and enhancing collaboration in STEMI education. Participants developed concrete, actionable plans and commitments to ensure impact extends to strategic implementation in respective contexts. The three topics were discussed to enrich country-based interventions drawing from promising practices in Kenya, Nigeria, Zambia and Ethiopia. Participants included representatives from the Ministry of Education, policymakers, education officials at both local and national levels, heads of schools at primary and secondary levels, and teachers of STEM subjects. Representatives of development partners drawn from STEM-based organizations in Africa also participated in the forum towards creating synergistic collaborations with the ministries of education.

The opening ceremony was presided over by the Principal Secretary, Ministry of Education Kenya represented by the Chair of Board of Governors, CEMASTEА - Dr. Pius Mutisya, flagged by the Chief Executive Officer, CEMASTEА - Mrs. Jacinta L. Akatsa, HSC (See inset). In the opening remarks, the chief guest emphasized that education policy cannot be built on assumptions, but on well-grounded research, and lived experiences that respond to evolving needs of learners and educators in an increasingly innovation-driven economies arising from STEMI education. The place of emerging technologies such as AI in STEMI pedagogy needs to be embraced in an effective manner, anchored in evidence-based policy and strategic collaborations. The webinar provided an important platform for education stakeholders to collaborate, share best practices, and collectively advance STEMI education in Africa.



The 2025 STEMtastic Adventures! African Symposium



CEMASTEА is co-hosting the [2025 STEMtastic Adventures! Africa Symposium](#) with the African Union Development Agency-New Partnership for Africa's Development (AUDA-NEPAD) and the Mobiles for Education (mEducation) Alliance, the leading convener of development and donor

agencies, foundations, and leading global authorities in education technology. The event will bring together: Ministries of Education and other government policymakers from across Africa; Regional development agencies and donors; Innovation leaders and practitioners; Representatives from multilateral and bilateral agencies; Non-profit and for-profit institutions and foundations;

The Symposium will feature a diverse range of STEM education presentations across several tracks including:

- AI and Emerging Technologies,
- Accessibility with Limited Resources,
- Conservation & Climate Education,
- Inclusive Education,
- Mathical Thinking,
- Foundational Learning,
- Youth Entrepreneurship / Employability,
- Teacher Empowerment,
- Policy and Funding.

Key stakeholders with common interest in exploring effective strategies for enhancing STEM education in pre-primary, primary, and secondary settings, especially in lower- resource contexts and across both formal and informal learning environments; Educational institutions and implementing partners; Leading researchers; and STEM educators, teachers, and students.

**July 22-25, 2025, at
CEMASTEА, Nairobi,
Kenya.**

Empowering JS Teachers on ICT Integration

By PWaibochi & AMumbi

Towards transforming education in Kenya, CEMASTEIA once again held a virtual training focused on ICT integration for Junior School teachers. The teachers were equipped with the tools and knowledge needed to thrive in a rapidly evolving educational landscape. The training theme, *“To enhance the ability of Junior School teachers to leverage ICT tools for effective learning,”* was not only timely but deeply aligned with the goals of the Competency-Based Education (CBE). As our schools continue to implement CBE, the integration of Information and Communication Technology (ICT) is no longer a luxury—it is a necessity. ICT empowers educators to create dynamic, engaging, and relevant learning experiences that prepare learners for the demands of the 21st century.

One of the most exciting aspects of this training is the introduction of Artificial Intelligence (AI) tools to support teacher productivity. From generating lesson plans to streamlining schemes of work, AI is poised to reduce administrative burdens and free up valuable time for what matters most—teaching. This forward-thinking approach ensures that teachers not only keep pace with technological advancements but also leverage them to enhance learning outcomes.

The training also placed a strong emphasis on Universal Design for Learning (UDL) and Social Emotional Learning (SEL). These frameworks are essential for creating inclusive classrooms that cater to the diverse needs of all learners. By fostering emotional intelligence and resilience alongside academic achievement, UDL and SEL support the holistic development envisioned by CBE.

Another highlight is the introduction to visual programming using the Scratch application. This hands-on experience will help teachers cultivate core competencies in their students, such as digital literacy, critical thinking, and problem-solving skills that are indispensable in today’s interconnected world.

The training will culminate in a practical challenge: each teacher will design a learner-centred lesson that integrates UDL, SEL, and AI tools. This exercise is more than an academic requirement—it is a powerful demonstration of how innovation can be woven into everyday teaching to create vibrant, inclusive, and effective learning environments.

To our dedicated educators: this is your moment. Embrace the opportunity to learn, collaborate, and grow. Ask questions, share your insights, and immerse yourself in this journey of professional transformation. The skills you gain here will not only elevate your teaching practice but will also shape the futures of the countless students you inspire every day.

Empowering Quality Assurance Officers to Champion STEM Implementation

By LMakanda & Dan Orero

In a bid to enhance oversight and support for Junior School teachers in Science, Technology, Engineering and Mathematics (STEM), CEMASTEА hosted a three-day training workshop from April 2–4, 2025 with the theme: *“Enhancing the Capacity of Quality Assurance and Standards Officers to Monitor & Support the JS teachers of STEM for Effective Implementation of the CBC Curriculum”*. The initiative aimed to equip newly recruited Quality Assurance and Standards Officers (QASOs) with skills necessary for effective Competency-Based Education (CBE) implementation.

Tailored to participants' needs identified through a pre-training survey, the workshop covered learner-centred pedagogies, curriculum interpretation, ICT integration and teacher support strategies. QASO's were trained to evaluate classroom practices, foster improved learning outcomes and strengthen STEM education at the school level.



Mr. Stephen Mogoba, Director of QASO at the Department of Planning, Policy and Finance, commended addressing participants.

Addressing participants at the opening ceremony, Mr. Stephen Mogoba, Director of QASO at the Department of Planning, Policy and Finance, commended CEMASTEА's leadership for organizing the training. Representing Dr. Evelyne Owoko, Head of QASO Directorate, Mr. Mogoba emphasized that STEM education is vital in achieving Sustainable Development Goals (SDG's) 4 on Quality Education. He reaffirmed that the training would help shape policies for effective STEM implementation at county levels. In his closing remarks, Dr. Pius Mutisya, Chair of CEMASTEА's Board of Governors, stressed the critical role of QASO's in ensuring quality curriculum delivery. He urged officers to keep pace with technological advancements and remain proactive in transforming STEM education.

Further reinforcing the significance of the initiative, CEMASTEА CEO, Mrs. Jacinta Akatsa, encouraged QASO's to take ownership of their responsibility, stating, “Teachers look up to you. Let's build their self-efficacy in implementing the curriculum as designed.” She also highlighted that feedback from the workshop would inform future capacity-building efforts.

Having previously trained 370 QASO's, CEMASTEА continues to be at the forefront of capacity building. As noted by Mr. John Makanda, Secondary School Programme Coordinator at CEMASTEА, QASO's play an instrumental role in enhancing teacher practices, a sentiment echoed by Madam Rahab Chiira, CEMASTEА's team lead during the workshop. The workshop underscored the collective effort in strengthening STEM pathways to meet the Basic Education Curriculum Framework (BECF) goals, ensuring 60% of learners transition into STEM fields. Participants were urged to unpack curriculum designs accurately and drive impactful change, thereby creating a ripple effect in learners' STEM proficiency.

With continued collaboration between CEMASTEА, QASO's, the Ministry of Education and various stakeholders, Kenya's vision for quality STEM education is on a firm trajectory towards success.

Multi-Sectoral Conference Puts Research & Innovation in Focus

By MMungai & DOrero

The 4th Multi-Sectoral Conference and Exhibition on Research, Science, Technology and Innovation (RST&I) took place from 9th – 12th June, 2025 at Naivasha. The event was inaugurated by Professor Shaukat Abdulrazak, the Principal Secretary for Science, Research and Innovation at the Ministry of Education, representing the Cabinet Secretary for Education.

In his speech, Professor Abdulrazak emphasized the critical role of STI in Kenya's transition towards an inclusive, knowledge-based economy. He reiterated its alignment with national development agendas, including Vision 2030 and the Bottom-Up Economic Transformation Agenda (BETA). The PS stressed the importance of multi-stakeholder collaboration, uniting government, academia, the private sector and county representatives to drive scientific progress.

The PS pledged to reinstate the Annual Science, Technology, and Innovation Week, a crucial platform that will solidify Kenya's leadership in STI and enhance its global competitiveness. In his address, the PS powerfully emphasized the critical need to demystify science through effective communication. He specifically applauded CEMASTEAs for its exemplary efforts in empowering teachers across Kenya. Prof. Abdulrazak highlighted CEMASTEAs transformative work in developing and promoting innovative pedagogies for mathematics and science



Professor Shaukat Abdulrazak, Principal Secretary for Science, Research and Innovation, seated 12th from the left, alongside distinguished delegates at the 4th Multi-Sectoral Conference on Research, Science, Technology and Innovation. The gathering highlights Kenya's commitment to advancing STEM education and multi-stakeholder collaboration

As Kenya continues to advance its research and innovation ecosystem, the conference served as a pivotal event in shaping the country's trajectory towards scientific excellence and socio-economic growth.



Professor Shaukat Abdulrazak, Principal Secretary for Science, Research and Innovation, engages with staff at CEMASTEAs booth, exploring innovative approaches to STEM education and communication

education, recognizing the Centre as a key driver in enhancing teaching quality and fostering a deeper understanding of STEM subjects among learners.

Unlocking the Potential of Young Learners in Science and Technology

By: KMakoba, WMagu & DRasto

The next generation should not just consume technology but create it. As the digital world evolves, mastering these skills is crucial for preparing young innovators for future opportunities.

CEMASTE A continues to empower young learners through its dynamic Science, Technology, Engineering, and Mathematics (STEM) boot camps.



CEMASTE A CEO Mrs. Jacinta Akatsa issues a certificate of participation to a participant of the 7th STEM Boot camp at CEMASTE A

These camps offer hands-on opportunities for students to design projects that address real-life challenges, enabling them to build skills and pursue their dreams of becoming future tech experts and innovators. Through such initiatives, CEMASTE A demonstrates its commitment to nurturing a generation of problem-solvers and creators, ready to shape Kenya's digital future.

The Boot camps held during the school holidays at the Centre bring together students from across Kenya and offer immersive training in robotics (Arduino, IoT, EV3, and Spike), mobile app creation, creative coding, and 3D design.

The STEM boot camps are key to building a skilled and diverse workforce, fostering innovation, and driving economic growth. They help young Kenyans develop 21st-century competencies, such as communication, collaboration, critical thinking, and problem-solving —vital skills for today's fast-changing world. Through interactive activities in robotics, coding, and digital design, students gain practical experience while learning to work collaboratively.

The camps promote teamwork, leadership, and exposure to emerging technologies. Participants are connected with mentors, professionals, and potential employers, thereby expanding their career networks and broadening their outlook. Learners are challenged to overcome setbacks, building resilience and fostering a deeper passion for STEM.

Parents acknowledge the impact that the camps have had on their children. They confess to a raised interest in mechatronics and improved performance in Mathematics and Physics, noting that Africa's preparation for the Fourth Industrial Revolution depended on equipping the youth with relevant skills.

Reclaiming Wellness from Inside Out: A Glimpse into a Wellness Session at CEMASTEА

By: The HR Department

Wellness sessions at CEMASTEА are more than just a break from routine—they are a vibrant reminder that well-being begins with small, joyful steps.

An energising dance segment that gets hearts pumping and spirits lifted kicks things off, and in just a few minutes, the atmosphere transforms into a space of laughter and lightness as participants stretch, move, and reconnect with their bodies. This playful interlude reminds all that wellness doesn't have to be complicated—it can start with something as simple as a dance.

In one recent session, the highlight of the day was an inspiring and deeply insightful session led by Jaini Shah, a former corporate lawyer turned certified Food Relationship Coach, WILDFIT Coach, and Rapid Transformational Therapist. With warmth and wisdom, Jaini guided us through a robust conversation titled **“Exploring the Power of Health.”**

In her talk, Jaini unpacked the often-overlooked connections between food, energy, and mindset. She addressed everyday struggles many professionals face, like the challenge of maintaining healthy eating habits, persistent fatigue, and the nagging feeling that we could be doing more for our health but don't know where to begin. Through relatable stories and a compassionate approach, Jaini reframed these challenges not as personal failures, but as signals—clues that something deeper within us needs attention. She shed light on how modern diets are often designed to work against our biology, and how cravings or low energy are not flaws, but feedback.

To ground her message, Jaini shared her own transformative journey, complete with striking before-and-after photos and candid reflections. Her story was a testament to the power of aligning food and mindset—and the tangible, life-changing results that follow. One of the most impactful takeaways was her introduction of the **“5 Rs” of Real Food**—a practical, guilt-free approach to eating in harmony with the body's natural design. She also emphasized the importance of shifting our internal dialogue and using mindset tools to build habits that last.

What made Jaini's session truly unforgettable was her ability to blend science, psychology, and personal experience with humour and heart. It wasn't just a wellness talk—it was an invitation to rethink what health means. This session was a refreshing blend of movement, inspiration, and meaningful conversation. This experience left us feeling energised, empowered, and ready to take the next step in our wellness journey.

At CEMASTEА, the well-being of our staff is a cornerstone of our workplace culture.

PICTURE SPEAK

By Dan Orero



CEMASTEAM actively engaged in several STEM outreach initiatives that brought scientific concepts to life through hands-on learning and exploration. From an exhibition at the 2025 KESSHA Conference to captivating school visits across counties, learners were immersed in interactive experiments that sparked curiosity in STEM.

FABLE: Necessity is the Mother of Invention



A thirsty crow wanted water from a pitcher. He filled it with pebbles to raise the water level to drink. Clever!

In a spell of dry weather, when the Birds could find very little to drink, a thirsty Crow found a pitcher with a bit of water in it. But the pitcher was high and had a narrow neck, and no matter how he tried, the Crow could not reach the water. The poor thing felt as if he must die of thirst.

Then an idea came to him. Picking up some small pebbles, he dropped them into the pitcher one by one. With each pebble, the water rose a little higher until at last it was near enough so he could drink.

Moral of the Story

The moral is "**Necessity is the mother of invention.**" This highlights the idea that challenges can inspire creative solutions. The fable teaches that using intelligence and resourcefulness can help overcome obstacles.

*In a pinch, a good use
of our wits may help
us out!*



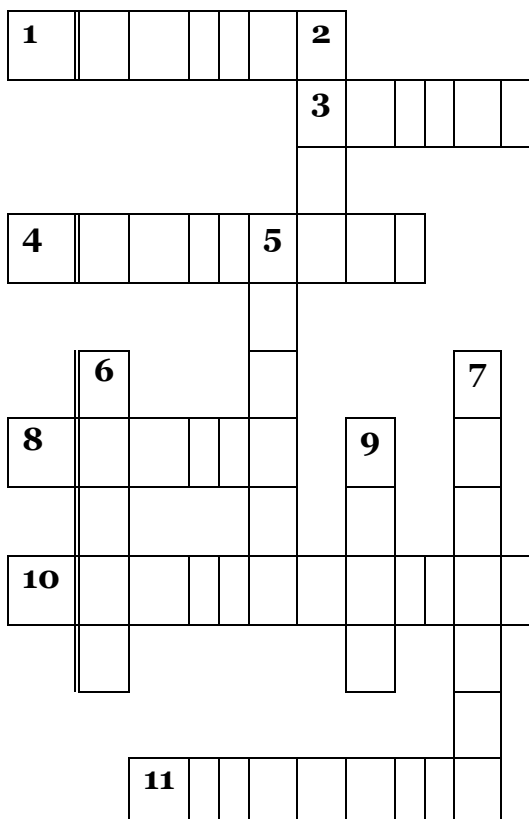
Proverbs 18:15
An intelligent heart
acquires knowledge,
and the ear of the wise
seeks knowledge.



Quran, 9:122

“...they could devote themselves to studies in religion, and admonish the people when they return to them, – that thus they (may learn) to guard themselves (against evil)”

Crossword

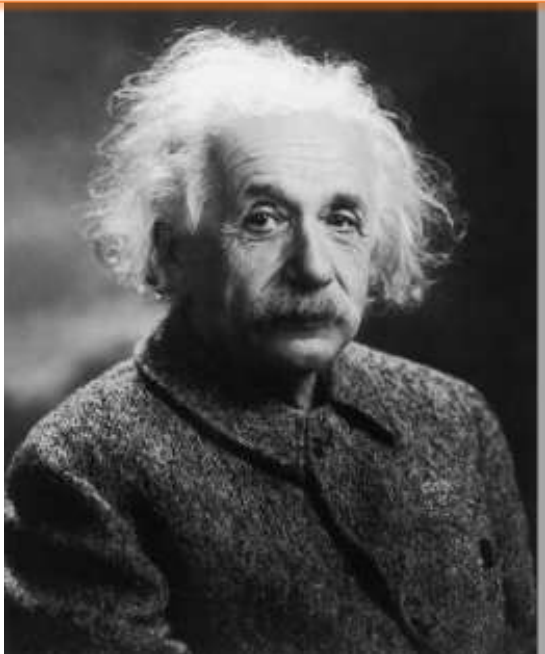


ACROSS

1. Centre of an atom (7)
3. Triple-bonded hydrocarbons(6)
4. Ph color charger (9)
8. Substance dissolved in a solution (6)
9. Type of acid in proteins(5)
10. Study of chemical processing in living organisms(12)
11. Study of matter and its interactions(9)

DOWN

2. Results of acid-base reaction(4)
5. Double-bonded hydrocarbon(6)
6. State of matter with definite shape(5)
7. Measure of disorder(7)
9. Proton donor(6)

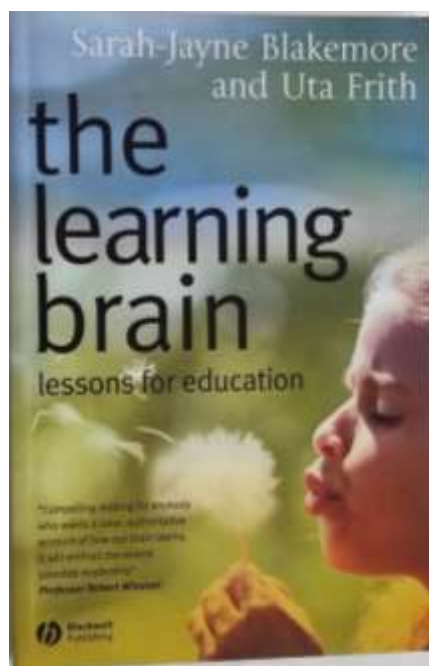


“The whole of science is nothing more than a refinement of everyday thinking.”

- Albert Einstein

BOOK REVIEW: The learning brain: Lessons for education

By Esther Nyambura



“The brain is constantly adapting to new information and experiences, creating new neural connections and strengthening existing ones”

“The learning brain” is a captivating book that studies how the brain learns and processes information, and how this knowledge can be applied to education. It explores the latest findings in cognitive neuroscience and how these findings can be applied in educational settings.

The book is divided into four sections, each covering a distinct aspect of learning, from brain development to motivation and emotions.

The first section focuses on the development of the brain and its impact on learning in childhood and adolescence. The second section examines how the brain processes and remembers information, while the third section

investigates the role of emotions and motivation in learning. The final section discusses the implications of this research for education and provides practical suggestions for teachers and educators.

The book challenges some of the traditional assumptions about learning. For example, the authors argue that the emphasis on testing and assessment in many educational systems can be counterproductive, as it creates anxiety and discourages students from taking risks and exploring new learning areas or ideas. The book proposes that the education system focus on creating a supportive and collaborative learning environment that encourages creativity and experimentation.

This book has a strong evidence-based foundation, where the authors provide a wealth of research studies to support their arguments. It also presents a compelling argument for a more student-centred approach to education and offers practical suggestions for achieving this goal.

“The Learning Brain” is an essential book for educators, parents, policymakers and any individual interested in enriching and improving the learning process and the overall education system.

“...there is no one-size-fits-all approach to education. Every student is unique, with their own strengths, weaknesses, and learning styles.”

How can we teachers, educators, policymakers and parents improve the way we educate our children?





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