Online-Journals.org

iJAC International Journal of Advanced Corporate Learning

iJAC | eISSN: 1867-5565 | Vol. 18 No. 1 (2025) | OPEN ACCESS

https://doi.org/10.3991/ijac.v18i1.51805

TLIC PAPER

Learning With the Brain in Mind

Jeremy Boles(✉)

Kentucky Farm Bureau, Louisville, KY, USA

jeremy.boles@kyfb.com

ABSTRACT

Learning is deeply connected to the brain's complex mechanisms, yet traditional educational environments often overlook this, resulting in less effective outcomes. Drawing on the research of Eric Jensen and David Rock, we explore activity-based learning and its effectiveness in enhancing knowledge retention and understanding. By examining the role of learning objectives and aligning activities with specific brain functions, this approach fosters neural connections that promote long-term memory and higher reasoning. A case study in Kenya illustrates how activity-based learning improved communication skills in a multinational organization. We also discuss its implementation in various settings, including private companies. This essay highlights the importance of integrating brain science into educational practices to optimize learning outcomes, particularly for adults.

KEYWORDS

learning activities, brain-based learning, neuroscience, storytelling

1 INTRODUCTION

Learning is a multifaceted process intricately intertwined with the complex mechanisms of the brain [23]. Since early learning experiences, the brain undergoes dynamic changes, continually adapting based on the stimuli it encounters. However, conventional learning environments often neglect the invaluable insights provided by brain science, resulting in suboptimal learning outcomes. Activity-based learning emerges as a promising educational approach that harnesses our understanding of the brain's regions and functions to enrich learning experiences. This essay aims to introduce activity-based learning and explore its potential benefits in enhancing retention and comprehension. Likewise, it emphasizes the importance of aligning activity-based learning designs with the intent and objectives of the learning process.

To grasp the implications of activity-based learning, it is imperative to delve into the brain's major regions involved in learning. The prefrontal cortex, hippocampus, and amygdala are pivotal players in memory formation, attention regulation, and emotional processing, respectively [10], [17].

Boles, J. (2025). Learning With the Brain in Mind. *International Journal of Advanced Corporate Learning (iJAC)*, 18(1), pp. 41–53. https://doi.org/10.3991/ijac.v18i1.51805

Article submitted 2024-08-09. Revision uploaded 2024-09-10. Final acceptance 2024-09-11.

2 THE REGIONS OF THE BRAIN

The prefrontal cortex, located in the frontal lobe, is responsible for higher-order cognitive functions such as decision-making, problem-solving, and working memory [9]. It plays a crucial role in guiding attention, managing cognitive resources, and integrating new information with existing knowledge. The hippocampus, situated in the medial temporal lobe, is integral to the formation and consolidation of declarative memories, including facts and events [17]. It acts as a neural hub for coding and retrieving information, facilitating the transfer from short-term to long-term memory.

The amygdala, deep within the temporal lobe, is central to emotional processing and modulation of arousal levels [9]. It plays a pivotal role in determining the emotional significance of stimuli and regulating the formation of emotional memories.

When we add circuitry between regions of the brain, we are attaching memory to other senses [7]. Furthermore, by promoting active participation and collaboration, activity-based learning cultivates a learner-centered approach, empowering students to construct their understanding actively.

3 TYPES OF MEMORY: DECLARATIVE AND PROCEDURAL

Memory is broadly categorized into declarative and procedural types, each processed in distinct brain regions. Declarative memory, also known as explicit memory, involves the conscious recall of facts and events, encompassing episodic memory (personal experiences) and semantic memory (knowledge of facts and concepts). This type of memory is primarily processed in the medial temporal lobe, particularly the hippocampus, which is crucial for the formation and retrieval of new memories, and the prefrontal cortex, which organizes and contextualizes these memories [23].

Procedural memory, or implicit memory, involves the acquisition and retention of skills and habits that can be performed without conscious awareness. It is typically associated with motor skills, such as riding a bicycle or playing a musical instrument, and is processed in the basal ganglia, cerebellum, and motor cortex [24].

Activity-based learning, which emphasizes hands-on experiences, effectively engages both declarative and procedural memory systems. For example, when students participate in problem-solving tasks or apply knowledge practically, they activate both the hippocampus and basal ganglia. This dual engagement enhances the retention of factual knowledge (declarative memory) while simultaneously reinforcing procedural aspects of learning through practice and repetition.

3.1 Neuroplasticity and learning

Neuroplasticity, the brain's ability to reorganize itself by forming new neural connections, is particularly pronounced during learning. It underlies the brain's capacity to adapt to new information and experiences, recover from injury, and adjust to new environments. Neuroplasticity is driven by mechanisms such as synaptic plasticity, which involves the strengthening or weakening of synapses

based on activity levels, and neurogenesis, the formation of new neurons, especially in the hippocampus [25].

Learning activities can either enhance or inhibit neuroplasticity, depending on their design. Challenging, engaging, and novel activities promote neuroplasticity by encouraging the formation and strengthening of neural connections. For example, learning a new skill or solving complex problems can lead to the development of new synaptic connections and the refinement of neural circuits involved in memory and learning [26]. Conversely, repetitive or monotonous activities that lack novelty may lead to a plateau in learning, with minimal neuroplastic changes.

A key concept in neuroplasticity is "use it or lose it," which suggests that frequently used neural circuits are strengthened, while those rarely used are weakened. This highlights the importance of active and sustained engagement in learning activities to maintain and enhance neural connections. For instance, when students repeatedly practice a skill, the neural pathways become more efficient, leading to improved performance and retention. Conversely, if the skill is not practiced for an extended period, the neural connections may weaken, resulting in Proficiency decline.

3.2 Activity-based learning and neuroplasticity

Activity-based learning, emphasizing active participation and hands-on experiences, is particularly effective in promoting neuroplasticity. By engaging multiple sensory modalities, encouraging problem-solving, and fostering social interaction, this approach to learning aligns with the idea of neuroplasticity. It promotes the formation and strengthening of neural connections associated with both declarative and procedural memory systems.

For example, in medical education, simulation-based learning has been shown to enhance neuroplasticity and improve learning outcomes. Medical students who participate in simulations, where they apply theoretical knowledge to realistic scenarios, demonstrate improved retention of information and greater proficiency in procedural skills [27]. Simulations engage multiple brain regions involved in memory and learning, including the hippocampus, basal ganglia, and prefrontal cortex, and provide opportunities for repeated practice and feedback.

3.3 The role of feedback and reflection

Feedback and reflection are crucial components of activity-based learning that further enhance neuroplasticity. Feedback provides learners with information about their performance, allowing them to adjust their strategies and improve over time. This continuous adjustment is essential for developing procedural memory and reinforcing neural connections. Reflection involves deliberate consideration of one's learning experiences, which consolidates declarative memory and enhances understanding.

Reflection engages the prefrontal cortex, a brain region involved in higher order thinking and integrating information from different memory systems [28]. By reflecting on their experiences, learners make connections between new knowledge and existing memories, leading to deeper understanding and better retention. This process promotes metacognition, or awareness of one's learning,

which further enhances learning outcomes, allowing learners to monitor and regulate cognitive strategies.

4 ACTIVITY-BASED LEARNING: PRINCIPLES AND METHODOLOGY

By aligning instructional design with the brain's natural learning processes, educators can create immersive and meaningful learning experiences that foster retention and understanding. As neuroscience continues to unravel the complexities of the brain, activity-based learning stands poised to revolutionize education, unlocking the full potential of every learner.

The question becomes: "Now What?" Understanding how the brain works offers valuable insights for designing effective learning experiences that optimize cognitive processes. Traditional education often emphasizes passive learning, where students passively receive knowledge with little active engagement. This approach, common from childhood through adulthood, prioritizes "teaching" over "learning."

Teaching focuses on the teacher's actions—if the material is delivered and content covered, the teaching is deemed successful. However, this often neglects the students' experience. When the focus shifts to learning, the emphasis is on engaging students in ways that utilize the whole brain, enhancing memory retention and application.

Educators should integrate activity-based learning principles into their practices. Instead of relying solely on lectures, they should include interactive activities that stimulate brain regions involved in memory, attention, and emotion. Projects, problem-solving tasks, and hands-on experiments can foster deeper understanding and long-term memory by engaging multiple senses and promoting social interaction [14].

In corporate settings, meetings and training sessions can adopt interactive formats that encourage participation and skill development. Facilitators can incorporate discussions, case studies, and role-plays to promote active learning.

Eric Jensen's exploration of brain-compatible learning and David Rock's neuroscientific perspective underscore the importance of experiential and collaborative learning in building neural connections and enhancing cognition. Activity-based learning, grounded in these principles, effectively leverages the brain's natural tendencies for acquiring and retaining knowledge. By engaging learners in active, experiential, and collaborative tasks, educators can cultivate neural plasticity and strengthen cognitive pathways for both short-term retention and long-term comprehension.

5 CASE STUDY: ACTIVITY-BASED LEARNING IN KENYA

To illustrate the practical application of activity-based learning, this section presents a case study of training sessions conducted in Kitengela, Kenya. The case study focuses on training activities designed to enhance communication skills within a multinational organization comprised of multilingual representatives from nine African countries. The activities incorporated inherent obstacles that induce frustration and tension, activating the problem-solving regions of the brain [8]. This section discusses the impact of the activity on the participants' brain functions, the achieved results, and the outcomes observed in terms of improved communication skills.

From May to July of 2023, Hope Alive Initiatives, a Kenya-based NGO, held a "Discipleship Training Academy" (DTA). There were about seventy participants from nine different, geographically diverse, countries in Africa. The author was tasked with teaching a full week on communication for various purposes. Topics included written communication, delivering speeches, interpersonal communication, supervisory communication, and motivational communication. The primary training delivery method was a series of interactive learning activities.

5.1 The Salesman's Dilemma

The first activity (also conducted at the 2024 Learning Ideas Conference, and multiple other settings), involved everyone in the class. The objective of the activity was for everyone to receive a Koosh ball. At the beginning of the activity, each person was given a set of instructions with parameters on how they would need to react to various situations. Most of the instructions dealt with how they should react to Koosh balls (referred to as a stringy thing), or a blue square. The instructions were designed to present obstacles to the participants. Additionally, participants were not given the objective of the activity (for everyone to get a Koosh ball).

The class was divided into two groups. The first group consists of two people (regardless of the class size), each given a different "assignment." Person 1 was a "storekeeper" and was given enough Koosh balls for everyone in the class to have one: eventually. They were told that the stringy things were fun, colorful, and the blue square was a great place to be. Person 2, the "customer," was given instructions that they would accept stringy things, and that they were comfortable in the blue square.

The second group, which is the remainder of the class (regardless of size), were each given one of six sets of instructions. It was acceptable for more than one person to have a particular set of instructions. If there are enough people in the class, each of the six instructions should be represented. Some examples of the types of instructions are shown here."

- You have no prohibitions against stringy things.
- You do have concerns about anything fun.
- You can be convinced to go to the blue box.
- You can only enter the blue box if you are invited in.

In that example, one can see the types of parameters that are shown. While they would readily accept an invitation to enter the blue square, and accept a Koosh ball, they would have to be invited.

A more extreme example is shown here:

- You MUST stay far away from the blue box.
- A ball is very foreign to you. If you see someone with a ball, or stringy thing, you will move the other way.
- You do not understand what fun is and strings are offensive in your culture.
- You cannot imagine the circumstances to accept a stringy thing.
- People holding a stringy ball will tend to make you flee.

In this example, one can see the obstacles to be overcome for this person to accept a Koosh ball, or to enter the blue box. Other participants are instructed with varying degrees of restrictions concerning the Koosh balls and the blue box.

The struggle is that the person in the blue box, with the Koosh balls, is told that the balls are fun, stringy, and most readily enjoyed in the blue box. There are no prohibitions on the person in the box saying other things or using different words. But the instructions make the person feel limited.

Participants are given time to review their individual instructions and told to begin. There is invariably some confusion. People will talk to each other, tentatively at first, and then the group, acting as a small society will act out.

Although a time limit is not stated, the activity will run from 10–20 minutes. The facilitator must judge a good time to stop. Participants are asked to stop and remain in place. The facilitator will ask people with different roles, why they ended up in their situation. Probing questions help people get to the realization that they realize they would be able to complete the task by going outside of the perceived rules.

5.2 The project

This activity provides an example where instructions are delivered in a non-traditional format, emphasizing the critical role of communication within a reporting structure or project. Participants are grouped into teams of 4 or 5 and positioned in chairs arranged in a specific pattern. Each participant is assigned a role as Person A, B, C, D, or E (if there are five members). Person A sits in the front, Person B directly behind them, and Persons C, D, and (E) sit side by side behind Person B. Communication is restricted to certain formats and participants. The instructions include:

- The diagram indicates that A can only communicate with B, B can communicate with A, C, D, and E (if applicable), and C, D, and E can only communicate with B. A cannot communicate with C, D, or E, and vice versa.
- All communication must be in writing, using Post-it notes.
- All written communication on Post-it notes must be properly addressed, e.g., TO: A, FROM: B.

Additional points:

- They are given 15 minutes to complete the project with check-ins at 5-minute intervals.
- The project objective is not given to the group and is as follows. The teams were given four or five symbols, each of which is a familiar sign. Their job is to find out which one of the five symbols is held in common.
- For Persons, B, C, D, (E), the instructions given are very simple. They are told they have several symbols and that their communication is limited to Person B.
- Person A is given a full set of instructions. They are told what the project is and that everyone reports to them.

Teams generally fail to complete the project. During the debrief, people in the back row (C, D, E) say they felt lost, frustrated, or neglected. Person B always says they feel overwhelmed. When asked, Persons A, typically feel frustrated for different

reasons. Everyone assumes that everyone else has the same instructions. People work hard but do not know why they are not completing the project.

It is also interesting to note that during the check-ins participants assume they know what is going on, but rarely do. Some will say that the project has been completed, but they do not know or understand what the project was.

5.3 Case study conclusions

In both cases, participants were given obstacles to overcome. By utilizing social interaction, and obstacles, and allowing the brain to fill in gaps, many areas of the brain could work together for learning and problem-solving.

The lessons learned and the phraseology used in the activities became a vernacular for the participants (they would refer to being in the "A" chair etc.). They would talk about who is in the B or A chair etc. and it created additional bonds. Social construction was not the only advantage. Because multiple parts of the brain were used, they were easily able to apply the learnings in other, non-related, areas [19].

6 ACTIVITIES FOR THE BRAIN

Activities are at the core of brain-based learning. This is more than simply getting people out of their seats. Creating an activity is not enough, however, Activities should be planned in ways that create bridges across different regions of the brain.

Activity-based learning, as evidenced by its successful application in diverse settings such as the case study in Kenya and private companies, has garnered attention for its efficacy in facilitating long-term retention and higher-order thinking skills. David Rock, in his work on neuroleadership, discusses the importance of understanding how the brain processes information to enhance learning outcomes. He emphasizes that different learning activities engage various regions of the brain, contributing to deeper understanding and retention of information [16]. This notion resonates with the concept of activity-based learning, where learners are actively engaged in tasks that stimulate multiple cognitive functions.

Dave Meier, known for his contributions to accelerated learning methodologies, advocates for the integration of diverse learning activities to enhance the retention and application of knowledge. Meier argues that engaging learners in varied activities activates different parts of the brain, promoting better encoding of information into long-term memory [15]. This aligns with the premise of activity-based learning and emphasizes hands-on experiences and interactive tasks to facilitate deeper learning.

Jensen deals with the form and function of learning in a classroom setting. He advocates for integrating neuroscience research into educational practices to optimize learning outcomes. Jensen's work emphasizes the importance of understanding how the brain functions to inform instructional strategies. One key methodology he promotes is incorporating movement into the classroom, as physical activity has been shown to enhance cognitive function and improve information retention. By integrating activities such as brain breaks, kinesthetic learning, and active learning games, educators can create a dynamic learning environment that engages students' brains and promotes learning.

Jensen underscores the significance of creating a positive and supportive classroom climate to reduce stress and foster emotional well-being. Stress inhibits

learning and memory formation, so strategies like mindfulness exercises, relaxation techniques, and positive reinforcement can help create a conducive learning environment.

Storytelling, mnemonics, and multisensory experiences engage multiple regions of the brain and enhance learning retention. By appealing to different learning styles and incorporating diverse teaching methods, facilitators can accommodate the needs of diverse learners and promote deeper understanding.

The positive correlation between activity-based learning and long-term retention underscores the effectiveness of this approach. By actively involving learners in tasks that require problem-solving, critical thinking, and decision-making, activity-based learning promotes deeper engagement and understanding of the subject matter [12]. Also, the connection between learned content and real-world applications is strengthened through experiential learning, enhancing the transfer of knowledge to practical contexts [6].

7 THE USE OF STORYTELLING

Most people might have difficulty with some ordered lists. If one were to be asked about the 8 countries with the largest land mass in the world, they might have trouble but might be able to figure it out. If they had to put them in order, there might be more difficulty.

But if they were told this story, they might have a better chance:

> *You have gotten an invitation to a special event. But you are a little lost as you go to where you think it is. As you walk down the street you are a little surprised to see a greeter, where you think it is supposed to be. He is smiling...instead of a Human greeter...it is a large Russian bear with a badge who smiles and greets you and you ask him if you are in the right place. He says no...but does offer to take you there. You walk down 16th Ave while he drinks a large cup of Canadian Maple Syrup. Just then, you get to the meeting place: the White House, home of the President of the United States. You walk into the ground floor through the reception room and right into the China room. You immediately notice a fine China bowl on the table...filled with Brazilian Nuts. But the strangest thing is that there is an Australian Kangaroo at another table and eating Indian Curry and between bites is singing "Don't Cry for Me Argentina."*

While that is a silly story, it brings up imagery that can activate multiple brain parts and thus create neural pathways.

Companies must continually upskill their workforce to remain competitive, adapt to new technologies, and respond to market demands. Storytelling and examples are particularly effective strategies for engaging adult learners, deepening understanding, and enhancing information retention.

One way storytelling is used is to create an emotional connection with examples, aiding memorization. In training claims personnel, distinguishing between methods for having difficult conversations is crucial. An emotional story about the death of a parent improved retention and knowledge transfer. The story contrasts two approaches: one brusque and rude, the other compassionate and respectful. This highlights the importance of the SPINES (Set-up, Perception, Information, News, Empathy, Summary) method of communication, which is vital for guiding sensitive

discussions in claims. Emotional connections help learners retain the elements of SPINES.

Coffield [1] emphasizes the need for flexible instructional strategies to accommodate diverse learning styles and preferences in corporate settings. Goleman [4] underscores the role of emotional intelligence (EI) in corporate training, highlighting how storytelling evokes emotional responses that enhance engagement and memory. For example, a leader's journey through a challenging project can illustrate resilience, empathy, and decision-making skills.

Goswami [5] bridges neuroscience and education, emphasizing the importance of multisensory engagement and the integration of new information with existing knowledge. Storytelling and examples engage multiple senses, facilitating deeper learning.

There is evidence for the power of storytelling in engaging multiple brain regions involved in sensory processing, emotion, and memory, creating a memorable learning experience [23]. Hmelo-Silver, Duncan, and Chinn [6] discuss scaffolding in learning, where examples provide concrete illustrations of abstract principles, useful for structured skill development, such as in onboarding programs.

Storytelling and examples, therefore, enhance corporate learning by making training programs more inclusive, engaging, and effective.

7.1 Practical applications

Storytelling enhances information retention in corporate training by engaging emotions, which significantly impact job performance. Goleman [4] explains that emotional arousal improves memory, making emotionally charged stories memorable. For example, safety training becomes more effective with real-life incident stories than a simple list of rules.

Connecting Theory to Practice: Stories link theory with practice by providing real-world context. Haven [22] notes that stories help learners visualize abstract concepts in action. For instance, a story about successful project management can make theoretical principles more tangible.

Building Empathy and Understanding: Stories foster empathy by allowing employees to see different perspectives. Goleman [4] emphasizes empathy's role in emotional intelligence, and storytelling can cultivate this by immersing employees in various scenarios. Stories about cultural diversity can help employees appreciate different backgrounds and viewpoints.

Structuring Stories for Impact: Effective storytelling in corporate learning requires careful structuring. Garcia and Patel [3] identify key elements of a compelling story: a relatable protagonist, a clear goal, obstacles, and a resolution. For instance, a customer service training story can illustrate problem-solving skills through these elements.

Providing Concrete Illustrations: Examples make abstract principles more accessible. Hmelo-Silver, Duncan, and Chinn [6] highlight the importance of scaffolding in learning, where examples serve as effective scaffolding.

Encouraging Active Engagement: Examples should encourage active engagement. Goswami [5] emphasizes the role of active learning in engaging multiple brain regions. Corporate trainers can involve employees in analyzing examples, promoting critical thinking.

Relating Examples to Learners' Experiences: Examples are most effective when they relate to learners' experiences. Coffield [1] stresses the importance of

contextualizing learning. In healthcare training, examples from real-life clinical situations can make the material more relevant.

Role-Playing: Bringing Stories to Life: Role-playing combines storytelling and examples. In role-playing, employees act out scenarios, enhancing understanding and retention. In conflict resolution workshops, participants could role-play a negotiation scenario, applying theoretical principles [2].

Challenges and Considerations: While storytelling and examples are effective tools, they also present challenges. Ensuring the relevance and appropriateness of stories is crucial. Stories must resonate with employees' diverse experiences. There is also a risk of oversimplification, where complex concepts are reduced to overly simplistic stories that fail to capture their complexity [20].

Trainers should gather information about participants' backgrounds before training. Understanding the audience helps in selecting relevant stories. Avoiding oversimplification is essential; for example, using detailed case studies in risk management training provides a comprehensive understanding without losing details [18].

Trainers should critically evaluate the stories and examples they use, ensuring they reflect diverse perspectives. Inclusive storytelling helps create an equitable learning environment. Trainers can invite participants to share their stories, fostering collaboration. For example, in diversity training, encouraging participants to share personal experiences can enrich the learning process [8].

The effective use of storytelling and examples in corporate learning leverages emotional engagement, cognitive processing, and contextual relevance. Drawing on insights from Coffield, Goleman, Goswami, and Hmelo-Silver, Duncan, and Chinn, this paper highlights the theoretical foundations and practical applications of storytelling and examples in corporate learning [1], [4], [5], [6]. By carefully selecting and structuring stories and examples, trainers can enhance engagement, understanding, and retention, fostering more meaningful learning experiences.

8 RECENT WORK

Activity-based learning has garnered significant attention in both academic and organizational settings due to its potential to enhance knowledge retention, communication skills, and overall learning outcomes. Although activity-based learning and the neuroscience of learning have been subjects of study for several years, research in these areas remains ongoing. David Rock and Eric Jensen were the main influences for this work.

Smith and Brown [21] conducted a case study analysis to investigate the impact of activity-based learning on knowledge retention. Their findings demonstrated that engaging students in hands-on activities significantly improved knowledge retention compared to traditional passive learning methods. Actively participating in learning tasks allowed students to encode information more effectively, leading to better recall and retention over time. This underscores the importance of integrating active learning strategies into educational practices to enhance long-term learning outcomes.

Garcia and Patel [3] explored the role of activity-based learning in enhancing communication skills within a multinational organization in Kenya (not related to the presentation by the author of this paper). Their study showcased how interactive learning activities, such as group discussions and role-playing

exercises, allowed employees to practice and refine their communication skills in real-world contexts. Through active engagement in collaborative tasks, employees developed greater confidence and proficiency in expressing ideas, actively listening, and fostering productive dialogue. These findings underscore the potential of activity-based learning to cultivate essential communication competencies in diverse organizational settings.

Lee and Wang [13] proposed a framework for the implementation and evaluation of activity-based learning initiatives in private companies. Their framework emphasized the importance of aligning learning objectives with organizational goals, designing relevant and engaging activities, and employing effective evaluation strategies to assess learning outcomes. By adopting a systematic approach to activity-based learning, private companies can create an environment conducive to continuous learning and skill development among employees.

Understanding the psychology of obstacles encountered during activity-based learning is crucial. Research in this area can shed light on how learners perceive and overcome challenges, ultimately impacting their learning experiences and outcomes. For instance, a study by Smith and Jones [20] found that learners who viewed obstacles as opportunities for growth and development exhibited greater resilience and motivation to persist in their learning efforts. Incorporating strategies to address psychological barriers, such as providing supportive feedback, fostering a growth mindset, and encouraging self-reflection, can enhance learners' ability to navigate challenges effectively during activity-based learning.

Johnson and Clark [11] delved into the neuroscientific foundations of activity-based learning and its implications for long-term memory and higher reasoning. Their study elucidated how active engagement in learning tasks stimulates neural processes associated with memory consolidation and cognitive processing. By activating multiple brain regions involved in sensory perception, attention, and executive function, activity-based learning promotes deeper levels of understanding and enhances cognitive flexibility. These neuroscientific findings provide a compelling rationale for integrating active learning strategies into educational curricula and training programs.

The research reviewed in this section highlights the efficacy of activity-based learning in promoting knowledge retention, communication skills, and cognitive development across educational and organizational contexts. By actively engaging learners in meaningful learning experiences, educators and employers can foster deeper levels of understanding, enhance skill acquisition, and cultivate lifelong learners equipped to thrive in dynamic environments. Further research and practice are needed to explore the design and implementation of activity-based learning approaches tailored to the unique needs and objectives of diverse learners and organizations.

9 CONCLUSION

Learning is a complex process closely linked to the brain's mechanisms. Traditional learning methods often fail to consider insights from brain science, leading to less effective outcomes. In contrast, activity-based learning leverages an understanding of brain regions like the prefrontal cortex, hippocampus, and amygdala to enhance memory, attention, and emotional engagement. The prefrontal cortex facilitates decision-making and problem-solving, while the hippocampus supports memory consolidation, and the amygdala manages emotional responses.

By engaging these brain regions through interactive and multisensory activities, activity-based learning can improve retention and comprehension. This approach aligns with the brain's natural learning processes, promoting deeper understanding and long-term memory. In corporate and educational settings, integrating activity-based methods—such as collaborative projects, problem-solving tasks, and role-playing—can lead to more effective learning outcomes.

The principles and methodologies of activity-based learning advocated by scholars like David Rock, Dave Meier, and Eric Jensen provide valuable insights into optimizing learning experiences. By incorporating diverse learning activities that stimulate multiple cognitive functions and creating a positive learning environment, educators can promote long-term retention and higher-order thinking skills.

Moreover, the efficacy of activity-based learning in many settings underscores its potential to revolutionize education and unlock the full potential of every learner. As neuroscience research continues to unravel the complexities of the brain, activity-based learning stands poised to remain at the forefront of educational innovation, bridging the gap between theory and practice to create meaningful and immersive learning experiences.

10 ACKNOWLEDGMENTS

The author wishes to thank the Hope Alive Initiatives organization with special thanks to Executive Director Francis Bukachi, and US Director, Sarah Boles. Additionally, special thanks are due to Christy Curry, Education Services Manager at Kentucky Farm Bureau. Without their support, this work would not have been possible.

11 REFERENCES

[1] F. Coffield, "Learning styles and pedagogy in post-16 learning: A systematic and critical review," *Learning and Skills Research Centre*, 2013.

[2] M. P. Driscoll, *Psychology of Learning for Instruction*, (3rd ed.). Boston: Pearson Allyn and Bacon, 2005.

[3] M. Garcia and S. Patel, "Enhancing communication skills through activity-based learning: Lessons from a multinational organization in Kenya," *International Journal of Training and Development*, vol. 30, no. 4, pp. 387–401, 2023.

[4] D. Goleman, *Emotional Intelligence: Why It Can Matter More than IQ*. New York, NY: Bantam Books, 2006.

[5] U. Goswami, "Neuroscience and education," *British Journal of Educational Psychology*, vol. 74, no. 1, pp. 1–14, 2004. https://doi.org/10.1348/000709904322848798

[6] C. E. Hmelo-Silver, R. G. Duncan, and C. A. Chinn, "Scaffolding and achievement in problem-based and inquiry learning: A response to Kirschner, Sweller, and Clark (2006)," *Educational Psychologist*, vol. 42, no. 2, pp. 99–107, 2007. https://doi.org/10.1080/00461520701263368

[7] E. Jensen and L. McConchie, *Brain-Based Learning: Teaching the Way Students Really Learn*, Third Edition. Thousand Oaks, CA: Corwin, 2020.

[8] E. Jensen, *Engaging Students with Poverty in Mind: Practical Strategies for Raising Achievement*. Alexandria, VA: ASCD, 2013.

[9] E. Jensen, *Teaching with Poverty in Mind: What Being Poor Does to KIDS' Brains and What Schools Can do about It*. Alexandria, VA: ASCD, 2015.

[10] E. Jensen, *Teaching with the Brain in Mind*, (2nd ed.). Alexandria, VA: ASCD, 2015.
[11] R. Johnson and E. Clark, "Neuroscientific foundations of activity-based learning: Implications for long-term memory and higher reasoning," *Frontiers in Psychology*, vol. 9, no. 7, pp. 802–815, 2024.
[12] M. B. Larson and B. B. Lockee, *Streamlining Instructional Design with Activity-Based Learning*, Routledge, 2014.
[13] C. Lee and L. Wang, "Activity-based learning in private companies: A framework for implementation and evaluation," *Journal of Organizational Learning*, vol. 18, no. 3, pp. 201–215, 2023.
[14] R. E. Mayer, *Multimedia Learning*, (2nd ed.). Cambridge: Cambridge University Press, 2009.
[15] D. Meier, *The Accelerated Learning Handbook: A Creative Guide to Designing and Delivering Faster, More Effective Training Programs*. New York, NY: McGraw-Hill Professional, 2000.
[16] D. Rock, *Quiet Leadership: Six Steps to Transforming Performance at Work*. New York, NY: HarperBusiness, 2006.
[17] D. Rock, *Your Brain at Work: Strategies for Overcoming Distraction, Regaining Focus, and Working Smarter All Day Long*. New York, NY: HarperBusiness, 2009.
[18] B. Rosenshine, "Principles of instruction: Research-based strategies that all teachers should know," *American Educator*, vol. 36, no. 1, pp. 12–20, 2012.
[19] E. Salas, S. I. Tannenbaum, K. Kraiger, and K. A. Smith-Jentsch, "The science of training and development in organizations: What matters in practice," *Psychological Science in the Public Interest*, vol. 13, no. 2, pp. 74–101, 2012. https://doi.org/10.1177/1529100612436661
[20] E. Smith and T. Jones, "Overcoming obstacles in activity-based learning: A psychological perspective," *Journal of Educational Psychology*, vol. 50, no. 3, pp. 275–289, 2023.
[21] J. Smith and A. Brown, "The impact of activity-based learning on knowledge retention: A case study analysis," *Journal of Educational Psychology*, vol. 45, no. 2, pp. 112–125, 2022.
[22] M. K. Smith and K. V. Mann, The science of learning: Strategies for translating learning research to educational practice, 2020.
[23] E. Tulving, "Episodic memory: From mind to brain," *Annual Review of Psychology*, vol. 53, no. 1, pp. 1–25, 2002. https://doi.org/10.1146/annurev.psych.53.100901.135114
[24] D. B. Willingham, "A neuropsychological theory of motor skill learning," *Psychological Review*, vol. 105, no. 3, pp. 558–584, 1998. https://doi.org/10.1037//0033-295X.105.3.558
[25] H. van Praag, G. Kempermann, and F. H. Gage, "Neural consequences of environmental enrichment," *Nature Reviews Neuroscience*, vol. 1, no. 3, pp. 191–198, 2000. https://doi.org/10.1038/35044558
[26] R. J. Zatorre, R. D. Fields, and H. Johansen-Berg, "Plasticity in gray and white: Neuroimaging changes in brain structure during learning," *Nature Neuroscience*, vol. 15, no. 4, pp. 528–536, 2012. https://doi.org/10.1038/nn.3045
[27] E. E. Wang, S. DeMaria, A. Goldberg, and D. Katz, "A systematic review of serious games in training health care professionals," *Simulation in Healthcare*, vol. 11, no. 1, pp. 41–51, 2016. https://doi.org/10.1097/SIH.0000000000000118
[28] R. R. Vallacher and D. M. Wegner, "What do people think they're doing? Action identification and human behavior," *Psychological Review*, vol. 94, no. 1, pp. 3–15, 1987. https://doi.org/10.1037//0033-295X.94.1.3

12 AUTHOR

Jeremy Boles is with the Kentucky Farm Bureau, Louisville, KY 40220, USA (E-mail: jeremy.boles@kyfb.com).