



Establishing Academic Self-reliance: A Researched-backed Notetaking Theory



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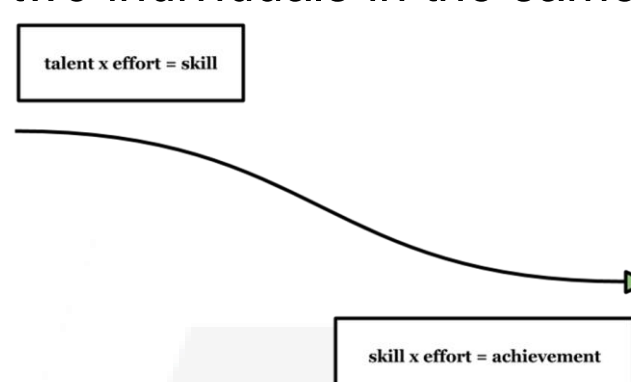
Introduction

- With the growing prominence of AI, the need for humanity to grow along with AI has become paramount. As important a tool as AI can become, society must remain diligent to learn and strive to continue to rely on human intelligence.
- To achieve this, individuals should strive to take a grit-based approach to learning to grow along with the exponential rise of AI. The goal of this presentation is to encourage individuals to put forth great effort in their studies, undertake research-backed notetaking techniques and methods to achieve a high level of academic self-reliance, ensure academic integrity, high standards of work, and to help ensure the survival and progress of a functioning society that can endure future problems that may arise.

Developing A Growth Mindset

Angela Duckworth is a world-renowned psychologist, a MacArthur Grant winner, and expert on "grit."

- Accurately predicted the success of West-Point students two years in a row and National Spelling Bee winners four years in a row with her grit scale.
- While outside factors matter such as having a good mentor, her grit theory matters most when two individuals in the same situation.



Anders Ericsson is a renowned psychological scientist known for the theory of deliberate practice, who challenges the myth of being born with natural abilities.

- In a study done on mathematicians and nonmathematicians, researchers found the parietal lobule had increased in relation to the time a mathematician studied mathematics.(2016)
- Einstein told his biographer Car Seelig, "I have no special talents. I am only passionately curious."
- Studies show depending on one's profession, certain parts of the brain may be more developed than others.
- Just as weightlifters can increase their muscle mass, humans can increase parts of the brain associated with their experiences.

"I came to appreciate that in doing something over and over again, something that was never natural almost becomes second nature."

- John Irving, Award winning author

Study Strategies

Three fundamental strategies according to neuroscientists outlined in the book, "Make It Stick"(Roediger et al.,2014):

- Retrieval practice** is a self-quizzing method. It is important to test one's self as honestly as possible to ensure mistakes are correctly addressed and rectified.
- Spaced practice** is crucial repeating the learning will help solidify knowledge in memory. When we forget information and become rusty, it is an opportunity not a detriment.
 - Reconstructing the memory improves both mastery and memory.
- Interleaving** involves mixing other topics and skills once a fundamental understanding of a topic is gained.
 - Allows continual assessment of knowledge and new connections to be formed, resulting in variety to recall information.

"Learning is deeper and more durable when it's effortful." -Roediger, McDaniel, Brown

Notetaking Techniques

- When notetaking there are two methods: passive notetaking and active notetaking. Passive notetaking uses strategies like highlighting to mark important information or copying verbatim. However, studies show lower levels of retention with passive notetaking. Active notetaking requires the learner to engage with the material, think critically about concepts, and requires effort. In active notetaking, the learner writes down key concepts and engages critically with the material. When using active notetaking methods creativity such as using symbols, abbreviations, colors, and drawings can further boost brain activity and make the act of notetaking more engaging and potentially more enjoyable.

Cornell Technique

- Cornell notetaking divides notes into four sections: the heading, key concepts and questions, notes, and summary.

- The heading can be used to note the material such as titles, lecturer, and other sources
- The key concepts and questions section is later derived from the written notes.
- The notes section should be in the learners' own words and address critical concepts. Leave space between sections of notes for additions and revisions.
- The summary is best done when using spaced practice methods and summarizes the content of the material in the learners' own words.

Feynman Technique

- Richard Feynman was a renowned physicist and professor. Studies have shown learners who use the Feynman Technique can achieve high levels of proficiency.(2021)

- Step one, choose a topic, study, and break down key concepts. Get a basic understanding.
- Step two, involves teaching it to someone else. This can be an imaginary person of any age, but it is best to use a real audience.
- Step three, requires you to fill in the gaps if they are revealed in step two and remove weaknesses.
- Step four, simplify your understanding so a child with a limited vocabulary can understand it. As Einstein said, "If you can't explain it simply, you don't understand it it well enough."

Mind Mapping Technique

- Mind mapping is a form of spider diagramming that draws from a central concept to connect ideas that flow to demonstrate relationships.

- Start from a central concept or topic you would like to study.
- Connect sub-topics and concepts and ideas to the central topic or concepts.
- Make sure ideas flow and transition in a way that can easily be followed.
- Get creative! Using drawings, symbols, and colors is highly encouraged.

Artificial Intelligence

- With the rise of AI, users can create content at far more rapid rates. Generative AI has excellent capabilities that can sometimes even fool experts. AI can produce music, digital art, software programs, author papers, and many other capabilities.
- With the right prompts, such automation can be a very potent tool and complete work with little effort.
- Pedagogy and learning science have also gained valuable tools to educate learners. Such as:

- Kinnu - Uses generative AI to deliver a high-quality learning environment for self study with expert-reviewed content.
- Khanmigo - Used by the internet-based learning platform Khan Academy, Khanmigo is capable of tutoring learners of all levels and has recently found itself in classrooms in a partnership with Project ECHO, that trains teachers how to use the software effectively with students with great success(2024).
- While these tools are highly capable, they are still prone to error.

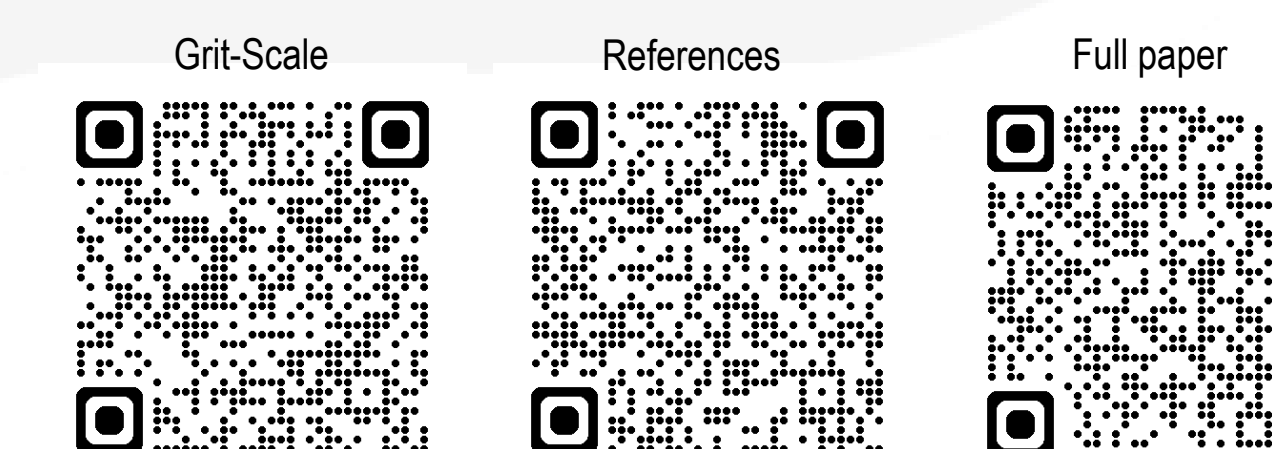
- However, despite seemingly great advantages AI can also have potentially detrimental effects on society such as:

- Cognitive off-loading, allows individuals to rely on the software to lighten a workload, and avoid using acquired skills or knowledge(or lack of), leading to a decline in our self-reliance to perform cognitive tasks.
- Decline of cognitive abilities of society.
- Dishonesty of accomplishments and cognitive abilities.
- Inability to properly interpret information during usage.

Conclusion

- To conclude, being self-reliant and adhering to academic policy is paramount. While generative AI can accomplish impressive feats and even provide the foundation for an entire learning platform, more accuracy regarding interpretability is needed. If the individual does not understand the subject matter generated, mistakes or outdated information may occur, resulting in potentially catastrophic outcomes. However, if an individual desires to learn effortfully, the individual can produce excellent outcomes and increase overall job satisfaction. Whether individuals are typing notes or writing them by hand, taking an active approach to learning can help bolster academic success. Individuals are encouraged to begin their journey, explore some learning strategies discussed or other reputable strategies, and develop a method suitable for their needs. When people learn how to learn and implement research-backed learning strategies in their studies, as a society, holding themselves to a higher standard and adhering to academic policies, they can mitigate the harmful effects on academic integrity and human intelligence while also raising their own capabilities.

Resources



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"A second brain system used to organize notes using Obsidian."

"Whether you think you can, or you think you can't - you're right."
-Henry Ford