INTERNATIONAL JOURNAL OF CURRENT ADVANCED RESEARCH
ISSN: O: 2319-6475, ISSN: P: 2319-6505, Impact Factor: 6.614
Available Online at www.journalijcar.org
Volume 11; Issue 10 (A); October 2022; Page No. 1626-1630
DOI: http://dx.doi.org/10.24327/ijcar.2022.1630.0363

Review

M.ED. STUDENT'S OPINIONS ABOUT 'HOW STUDENTS LEARN'

A. Ramakrishna

Head, Department of Education, Osmania University, Hyderabad

ARTICLE INFO

Article History:

Received 12th September, 2022
Received in revised form 21st September, 2022
Accepted 12th October, 2022
Published online 28th October, 2022

Key words:

Neuromyths, Constructivism, Peer Learning, Information Processing

ABSTRACT

Neuromyths exist in teachers which need to be rectified as early as possible because they reflect in their teaching practice and interfere with their effective teaching and consequently students learning. To ascertain opinions on how students learn and the prevalence of neuromyths in M.Ed. students at University College of Education, Osmania University, Hyderabad, a study was conducted. Fourteen students participated in the study. Seven female and seven male students responded to the questionnaire. Their combined average age is 32. The author teaches them Research Methods in Education. The tool consists of 32 items, of which 19 are generic assertions about the brain and 13 are neuromyths. Male respondents have more neuromyths than female respondents, according to the study's findings. They have seven of the thirteen neuromyths. Further, there is no difference in the opinion of male and female respondents regarding broad assertions about the brain.

INTRODUCTION

Teachers will always be required to make professional decisions regarding classroom practice based on their expertise in students and subject matter. However, we think that the learning sciences should also be well-understood for instructors to make decisions that are in line with the most current research in our field on how students learn.

The following is how students learn. With previously learned concepts, students can learn new concepts. Peer learning involves students teaching and learning from one another. It is most successful for students to learn by making connections between new information and ideas they already understand in classrooms where there is active social interaction and a variety of learning strategies are used to negotiate to understand.

Research in cognitive science and educational psychology shows how teachers can consider the past knowledge that students bring to the classroom and create environments that support students in creating new knowledge, reflecting on their learning, and applying it to different contexts.

When a student receives information, it is first quickly stored in sensory storage, then transferred to the short-term or working memory, and finally either forgotten or transferred to the long-term memory as semantic memories (concepts and general information), procedural memories (processes), or images. Since we experience an overload if we have more than seven pieces of knowledge in our short-term memory at once, the information must be transferred from the short-term memory to the long-term memory for learning to take place.

Science of Learning (2015) study provides a summary of the cognitive science relevant to how students learn. Six scientific concepts give the clearest picture of how pupils learn:

1. Students retain information better when given numerous opportunities to practise pulling information from their long-term memory and thinking about its significance.
2. Students retain new information and connect it to what they already understand before learning it.
3. Through feedback, problem-solving and critical thinking abilities are built and largely rely on prior knowledge
4. Students must fully comprehend the problem's structure and context to apply their knowledge to fresh circumstances
5. Numerous social and psychological factors influence student motivation
6. Though frequent in the educational system, misconceptions regarding learning shouldn't affect how curricula are developed or how instruction is imparted.

Each learner builds his or her knowledge and comprehension by thinking back on their personal experiences. They create mental models to help them make sense of their experiences. Therefore, as we gain knowledge, we modify and enhance those models to fit this novel experience. When our brains take in information, store it, organize it, and record it, learning occurs.

When infants start learning, for example, is one of the interesting issues that new research on the mind and brain answers. In what ways do professionals differ from non-experts in their learning processes? What can educators do to

Corresponding author:* **A. Ramakrishna
Head, Department of Education, Osmania University, Hyderabad

maximize student learning using curricula, learning environments, and teaching strategies? Our knowledge of what it means to know is greatly enhanced through new information from a variety of scientific disciplines, including the neurological processes involved in learning and the impact of culture on what people observe and imbibe. These findings are examined in the book "How People Learn" along with how they might change what we teach, how we teach it, and how we assess what our pupils have learned.

A neuromyth, following OECD (2002), is "a misperception caused by a misinterpretation, a misreading, a misrepresentation, or a misquotation of facts produced scientifically (by brain research) to support the application of brain research in education and other contexts".

Researchers Dekker, S. Lee, Nikki, Howard-Jones, P., and Jolles (2012) found that teachers frequently believed 49% of the neuromyths, especially those that had to do with for-profit educational endeavours. Over 70% of the general knowledge questions had appropriate answers. On general knowledge assessments, teachers who read popular science periodicals did better. Increased general knowledge was also anticipated to lead to an increase in neuromyth belief. These results imply that teachers who are excited about the potential of integrating brain research into the classroom may have trouble discerning fact from fiction. Teachers do not seem to be shielded from believing neuromyths by a more fundamental understanding of the brain. To prevent future misconceptions of this nature and to forge successful partnerships between neuroscience and education, there is a clear need for increased interdisciplinary communication.

Using myths in the classroom is not only a waste of money, time, and effort, but it could also cause instructors to lose faith in the possibility of a fruitful partnership between the fields of neuroscience and education (Pasquinelli, 2012).

The inclusion of neuroscience classes in basic teacher education may increase teachers' knowledge of the field. Additionally, initial teacher preparation programs should cover how to assess scientific research (Lilienfeld, S.O., Ammirati, R., and David, M., 2012). This would help instructors to adopt a skeptical mindset when it comes to the material they are given and carefully consider the available scientific data before incorporating neuroscientific results into their lesson plans (Howard-Jones, 2009).

Dekker et al. (2012) found that it can be challenging for teachers to distinguish between science and pseudoscience when they are excited about the possible uses of neuroscience research in the classroom. The fact that educators are eager to learn more about the brain and how it affects learning is positive. The study found that teachers who read popular scientific periodicals had a greater understanding of the brain. Teachers gave the environment a lot more consideration. Knowledge of the human brain, in general, was positively connected with a belief in neuromyths. The current study examined beliefs about how students learn (generic notions about the brain) and the frequency of neuromyths among masters in education students (M.Ed.) of University College of Education, Osmania University, Hyderabad. The hypotheses were that gender influences the prevalence of neuromyths and the opinion about how students learn.

M.Ed. students have the 'concept of learning as a part of their curriculum and besides their study on 'various theories and types of learning in their Bachelor of Education program. The understanding of how students learn helps them plan to teach learning strategies to their students. Thus, the study about how learning takes place and the factors influencing learning is significant. This has a direct bearing on their interaction with the learner and the instructional material in planning learning experiences appropriate to the student's standard.

MATERIAL AND METHOD

Participants

The total sample is 14 participants, 7 female and 7 male (students) pursuing master's in education at the University College of Education, Osmania University, Hyderabad. The participants are 32 years old on average.

Procedure

A survey method is adopted for collecting the data from the M.Ed. students from University College of Education, Osmania University, Hyderabad approached to be part of the study to give their opinion on 'how students learn. On a specified day when the author is engaging the students for Research Methodology class, he has administered the tool after explaining the purpose of the study. It took 30 minutes on average to complete.

Measures

The Almarode, J. (2014) questionnaire, titled simply "How Students Learn," contains 32 statements regarding the brain and how it affects learning. It contains 13 claims that the OECD (2002) and Howard-Jones, P.A., Franey, Mashmoushi, and Liao, Y.C. (2009) deemed to be educational neuromyths, such as "Children must be exposed to an enriched environment from birth to three years or they would permanently lose learning capacities." The remaining 19 claims were generalizations about the brain, such as Learning happens because of changes in the connections between brain cells. Neuromyths and knowledge assertions were presented in random order. "True / correct," "false / incorrect," or "do not know" were the options. The percentage of accurate replies to general claims and the percentage of incorrect responses to neuromyth claims were dependent variables (where a higher percentage indicates more belief in myths). A score of 1 (one) is given for a correct response only while the significant ones are incorrect and do not know responses. Thus, the total score of an individual is the total number of correct responses. The minimum score possible is 0 (zero) and the minimum is 32 (thirty-two).

Data analysis

The information was manually examined. The level of significance is 0.01. Chi-square tests were used to examine differences in the percentage of general claims that were correctly answered and the percentage of neuromyths (dependent variables). The dependent variable was the percentage of right responses to general statements, and the independent variable was gender. The raw data on brain-related myths and broad claims are shown in table 1.

Table 1 Scores on the Tool – How do Students Learn

Respondent No. & Gender / Item No.	Aspect	1 F	2 M	3 F	4 F	5 M	6 M	7 F	8 M	9 M	10 F	11 F	12 F	13 M	14 M	Total (correct)	Total (incorrect & do not know)
1	Brain 24hr/day	1	1	1	-	1	-	-	1	1	1	-	1	1	-	9	5
2	*Native language*	-	-	-	-	-	-	-	*1*	-	*1*	-	-	-	*1*	*3*	*11*
3	Boys -bigger brains	-	-	-	-	-	-	-	1	-	-	-	1	1	1	4	10
4	*Water – brain*	*1*	*1*	*1*	*1*	-	-	-	-	-	-	-	-	*1*	*1*	*6*	*8*
5	Damage to brain	-	-	-	-	-	1	-	-	-	-	1	-	-	1	3	11
6	*Use 10% of brain*	-	-	-	*1*	-	-	-	-	*1*	-	*1*	*1*	-	*1*	*5*	*9*
7	Brain – hemispheres	1	1	1	-	1	1	-	1	-	1	1	-	1	-	9	5
8	*Differences in how we learn*	-	-	-	-	*1*	-	-	-	-	-	*1*	*1*	*1*	*1*	*5*	*9*
9	Brain Develops at different rates	-	1	1	-	1	-	1	1	-	-	-	1	1	1	8	6
10	Brain Development finished - puberty	1	1	-	1	1	1	-	1	-	1	1	1	-	-	9	5
11	*Specific periods in childhood*	*1*	*1*	*1*	*1*	-	*1*	*1*	*1*	-	*1*	-	-	*1*	*1*	*10*	*4*
12	Networks of cells	1	1	1	-	1	1	1	1	-	-	-	1	1	1	10	4
13	Addition of new cells	1	-	1	1	1	1	1	-	1	-	-	1	1	-	9	5
14	*Learning style*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*14*
15	Connections – brain cells	1	1	1	1	1	-	-	-	1	-	1	-	1	-	8	6
16	Breakfast impacts achievement	1	1	1	1	-	-	1	1	1	-	1	1	-	1	10	4
17	Dyslexia	-	-	-	1	-	1	-	1	-	1	1	-	-	1	6	8
18	Normal development of brain	-	1	1	-	1	-	-	1	-	-	-	1	-	1	6	8
19	Mental capacity	1	1	1	1	1	1	1	-	1	1	1	1	-	-	11	3
20	Exercise for mental function	1	1	1	1	-	-	-	1	1	1	1	-	1	1	10	4
21	*Enriched environment*	*1*	-	-	*1*	-	*1*	*1*	-	*1*	*1*	*1*	*1*	-	*1*	*9*	*5*
22	*Impact of sugary drinks/snacks*	-	-	-	*1*	-	*1*	*1*	*1*	-	*1*	*1*	-	-	-	*6*	*8*
23	Circadian rhythms	-	1	1	1	1	-	1	-	1	-	-	-	-	1	7	7
24	*Motor-perception skills*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*14*
25	*Rehearsal of mental processes*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	-	-	*1*	*1*	-	*1*	-	*10*	*4*
26	*Learning styles – senses*	-	-	-	-	-	-	-	-	-	*1*	*1*	-	-	*1*	*3*	*11*
27	*Learning problems*	-	*1*	*1*	*1*	*1*	*1*	*1*	-	*1*	*1*	*1*	*1*	-	-	*10*	*4*
28	New connections	1	1	-	-	1	1	1	-	-	1	-	1	-	1	8	6
29	*Motor coordination exercises*	-	-	-	-	-	-	-	-	*1*	*1*	*1*	*1*	-	*1*	*5*	*9*
30	Specific periods – easy to learn	1	1	1	1	1	1	1	-	1	1	1	1	1	-	12	2
31	Sleep – brain shuts down	1	1	1	1	1	1	1	1	1	1	1	1	1	-	13	1
32	Music – reasoning ability	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	13
Total (correct)		16	18	18	17	16	15	14	14	13	17	18	17	14	18	225	-
Total (incorrect & do not know)		16	14	14	15	16	17	18	18	19	15	14	15	18	14	-	223

The scores of individuals range from 13 to 18. The number of correct responses to each of the items is maximum (13) for item 31, while the minimum (01) is for item 32. While the items nobody got correct are 14 and 24.

Chi-square is conducted to find if gender influences the opinion on the neuromyths. The following table 2 displays this.

Table 2 Chi-square test – Female and Male Incorrect and Do Not Know Responses on the Neuromyths

	Female	Male	Total
Observed (f_o)	50	60	110
Expected (f_e)	55	55	110
$(f_o - f_e)$	5	5	
$(f_o - f_e)^2$	25	25	
$(f_o - f_e)^2 / f_e$	0.45	0.45	

$\chi 2 = 0.90$ $df = 1$ P = 0.33

Hence, gender influences the opinion on neuromyths.

Next, a chi-square test is conducted to know if gender influences the opinion on general statements about the brain. Table 3 gives the data of the Chi-square test on female and male correct responses to general statements about the brain. Thus, gender does not influence the opinion on general

Table 3: Chi-square test-Female and Male Correct Responses on General Statements

	Female	Male	Total
Observed (f_o)	76	77	153
Expected (f_e)	76.5	76.5	153
$(f_o - f_e)$	0.5	0.5	
$(f_o - f_e)^2$	2.5	2.5	
$(f_o - f_e)^2 / f_e$	5	5	

$\chi 2 = 10$ $df = 1$ P = 0.01

Fifty seven percent (57%) of respondents' opinion on the brain is correct, while 41% of students expressed incorrectly and only 0.7% were ignorant about the general statements about the brain.

RESULT

Overall, students' responses to comments supporting neuromyths indicated that they believed these falsehoods in 85% of cases. Between male and female pupils, there was no discernible variation in the overall incidence. As can be shown in Table 1 from a study of the replies, there was substantial heterogeneity between the neuromyths.

A higher percentage of wrong and unsure responses to the neuromyths indicated that more people believe in myths. More than 61 percent of the students believed seven out of the thirteen myths. The most common neuromyths believed are –

Table 4 Correctness of Responses for Each Neuromyth Assertions

S.No.	Item	Incorrect (%)	Correct (%)	Do not know (%)	Total
1	It is recommended for kids to study their native language first before moving on to a second one.	78.6	21.4	0	100
2	Students' brains shrink if they don't get enough water to drink.	50.1	42.8	7.1	100
3	We only use 10% of our brain.	64.3	35.7	0	100
4	Different learning styles can be attributed to the fact that some people are "right-brained" while others are "left-brained."	78.6	21.4	0	100
5	After a certain age, some things can no longer be learned throughout childhood.	28.6	71.4	0	100
6	When information is presented to people in their preferred learning style, learning is improved (e.g., auditory, visual, kinesthetic).	100.0	0	0	100
7	From birth to age three, children must be exposed to a rich environment; else, they will permanently lose their ability to learn.	35.8	64.2	0	100
8	After drinking sugary drinks and/or snacks, kids are less attentive.	57.2	42.8	0	100
9	The synchronization of motor and perceptual abilities can be practiced through reading exercises.	100.0	0	0	100
10	The shape and operation of specific brain regions can change when certain mental functions are repeatedly practiced.	28.6	71.4	0	100
11	Children's learning patterns are heavily influenced by their senses (i.e., seeing, hearing, touch).	78.6	21.4	0	100
12	Education cannot solve learning issues brought on by developmental disparities in brain function.	28.6	71.4	0	100
13	Exercises that require quick bursts of motor coordination can enhance the integration of left and right hemispheric brain activity.	64.3	35.7	0	100
	Average	**61.02**	**38.43**	**0.55**	**100**

Table 5 Correctness of Responses for 'How do Students Learn'

S.No.	Item	Correct (%)	Incorrect (%)	Do not know (%)	Total
1	We constantly employ our brains.	64.2	35.8	0	100
2	On average, boys have larger brains than girls.	28.6	71.4	0	100
3	Other areas of the brain can take over a damaged brain area's function.	21.4	78.6	0	100
4	The brain's left and right hemispheres collaborate.	64.2	28.7	7.1	100
5	The brains of boys and girls develop at different rates.	57.1	42.9	0	100
6	When youngsters reach puberty, brain development is complete.	64.2	35.8	0	100
7	The brain stores information in networks of cells that are dispersed all around the structure.	71.4	28.6	0	100
8	New brain cells are added because of learning.	64.2	35.8	0	100
9	Changes in the connections between brain cells are the result of learning.	57.1	42.9	0	100
10	Skipping breakfast might have a negative impact on academic performance.	71.4	28.6	0	100
11	Seeing letters backward is a typical dyslexia symptom.	42.8	57.2	0	100
12	Brain cell formation and death are natural processes that occur during human brain development.	42.8	57.2	0	100
13	The environment or experiences cannot alter a person's genetically determined mental capacity.	78.5	21.5	0	100
14	Exercise that is vigorous can enhance mental performance.	71.4	28.6	0	100
15	Teenagers' circadian rhythms ("body clock") change, leaving them sleepy during the first few lessons of the day.	50.0	42.9	7.1	100
16	Even as people age, their brains can continue to form new connections.	57.1	42.9	0	100
17	There are stages in childhood when learning certain things is simpler.	85.7	14.3	0	100
18	The brain shuts down while we are sleeping.	92.8	7.2	0	100
19	The capacity for reasoning in children is improved by listening to classical music.	7.1	92.9	0	100
	Average	**57.48**	**41.78**	**0.74**	**100**

1. It's ideal for kids to master their native tongue before picking up a second one (78.6 percent).
2. Only 10% of our brain is used (64.3 percent).
3. Some people are "left-brained," while others are "right-brained," which explains why some people learn differently from others (78.6 percent).
4. When information is presented to people in their preferred learning style, learning is improved (e.g., auditory, visual, kinesthetic). (100 percent).
5. Practice for motor-perception coordination exercises might enhance literacy abilities (100 percent).
6. Children learn primarily through their senses, including sight, hearing, and touch (78.6 percent).
7. Exercises that require quick bursts of motor coordination can enhance the integration of left and right hemispheric brain activity. (64.3 percent).
8. The Chi-square test indicates that female and male respondents differ in their opinion about neuromyths - female (41) compared to male (31).

How do students learn?

The Chi-square test indicates that female and male respondents differ in their opinion about the general statements about the brain and it is negligible. The female respondents do not differ in their opinion about general statements about the brain.

DISCUSSION

The author, who teaches educational research at the University College of Education, Osmania University, Hyderabad, investigated the students' the prevalence of neuromyths and general understanding of the brain. More than 71 percent of the students agreed with three of the 13 myths. The neuromyths had an average score of 38.43%. Female respondents (41) scored better than male respondents (31).

On the general knowledge test about the brain, the average result was 57.48 percent. The female respondents' (76) score was somewhat lower than the male respondents (77).

ACKNOWLEDGEMENTS

I acknowledge the students who have participated in the study. They responded sincerely on the questionnaire about how students learn.

References

1. Dekker, S. Lee, Nikki, Howard-Jones, P. A. and Jolles, J.(2012). Neuromyths in Education: Prevalence and Predictors of Misconceptions among Teachers. Frontiers in psychology. 3. 429. 10.3389/fpsyg.2012. 00429.
2. Garrett H, E (1985). Statistics in Psychology and Education. Vakils, Feffer and Simons Ltd. Bombay.
3. Howard-Jones, P.A. (2009). Skepticism is not enough. *Cortex* 45, 550 – 551.
4. Howard-Jones, P.A., Franey, L., Mashmoushi, R. and Liao, Y.C. (2009). The neuroscience literacy of trainee teachers. *Paper presented at British Educational Research Association Annual Conference, Manchester.*
5. https://deansforimpact.org/resources/the-science-of-learning/
6. https://lo.unisa.edu.au/mod/book/tool/print/index.php?id=610988
7. https://poorvucenter.yale.edu/FacultyResources/Student-Learning#:~:text=Students%20learn%20by%20connecting%20new,through%20interaction%20and%20varied%20approaches
8. https://www.edutopia.org/blog/how-people-learn-evidence-based-paul-bruno
9. Lilienfeld, S.O., Ammirati, R., and David, M. (2012). Distinguishing science from pseudoscience in school psychology: science and scientific thinking as safeguards against human error. *Journal of School Psychology, 50, 7 – 36.*
10. Organization for Economic Cooperation, and development. (2002). *Understanding the Brain: Towards a New Learning Science.* Paris: OECD.
11. Pasquinelli, E. (2012). Neuromyths: why do they exist and persist? *Mind Brain Education.*6, 89 – 96.

How to cite this article:
Ramakrishna., (2022). M.Ed. student's opinions about 'how students learn. *International Journal of Current Advanced Research*, 11(10), pp. 1626-1630. DOI: http://dx.doi.org/10.24327/ijcar.2022.1630.0363