

BENEFITS OF THE NEW ERA: ANALYZING THE FEASIBILITY OF INCORPORATING VIRTUAL ASSISTANCE WITHIN EDUCATION

The background of the image is a blurred library or study area. In the foreground, there is a stack of three books. The top book is open, showing its pages. Surrounding the books and the text are various mathematical symbols and icons, including pi (π), infinity (∞), plus (+), multiplication (×), and a hand pointing to a screen, all rendered in a light, glowing white color.

By: Mon'Quarius Vereen

Scenario:

- Have you ever encountered challenges comprehending the current classroom material being reviewed?
- Have you ever needed additional assistance after class hours to better help you understand and complete assignments that were urgent?
- Do you feel that learning from a personal experience enhances your understanding more than group learning?

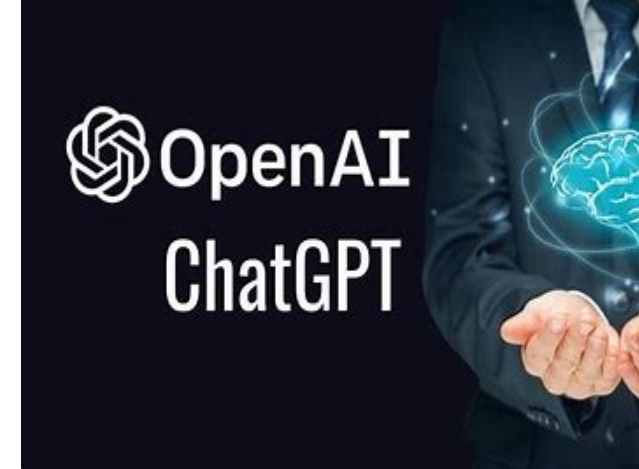
Thesis Statement:

- Simply put, the world is changing, and it is changing at an exponential rate. This is especially prominent for the newer generation of kids. “Because many children are familiar with digital technology even before school enrolment, it's critical to train skills needed to succeed in a digital environment.” (Asmar, 2022). The integration of virtual assistance within the educational system would help aid in that task by introducing a new standpoint for education, opening the opportunity to challenge the limitations of the already pre-installed traditional teaching methods. Effectively adapting and upgrading the systems set from the past, in order to ensure a brighter future.

- **So, the question is would it be feasible?**

Key-Word Descriptions:

- **Machine Learning-** the use and development of computer systems that are able to learn and adapt without following explicit instructions by using algorithms and statistics to analyze patterns in data.
- **Artificial Intelligence-** AI is the theory and development of computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.
- **Virtual Assistant-** a device, app, or computer program that can respond to commands or questions and perform tasks electronically.

The image shows the Chegg logo, which consists of the word 'Chegg' in a white, rounded, sans-serif font centered on a solid orange square background.

Research Questions:

01

How would Virtual Assistance benefit the current university and other universities within the education system?

02

What are the major differences and or improvements that AI-virtual assistance would bring to the traditional educational format?

03

How can AI-powered virtual tutors influence students' overall learning outcome?

04

How vast can this concept travel outside of its initial base state?

Target Audience:

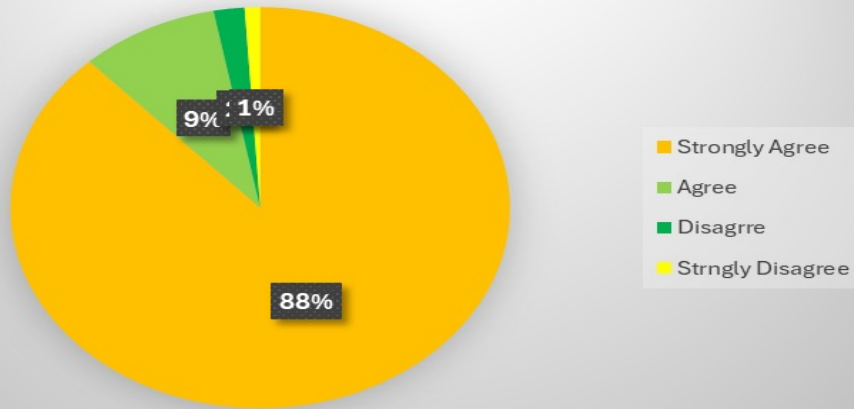
Consumers → Students

Facilitators → Teachers & Parents

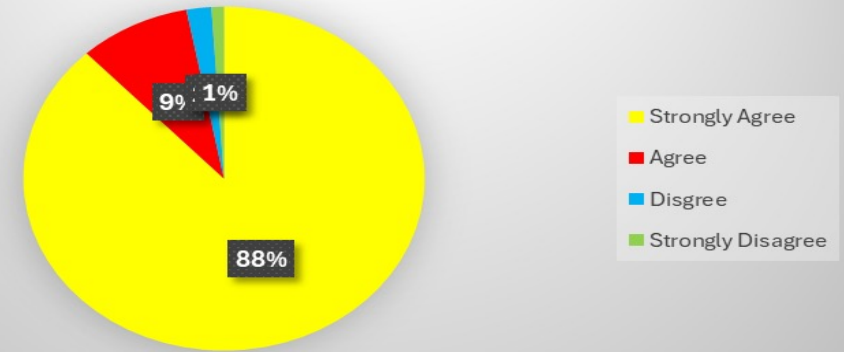
Patrons → School Board

Pie Graphs:

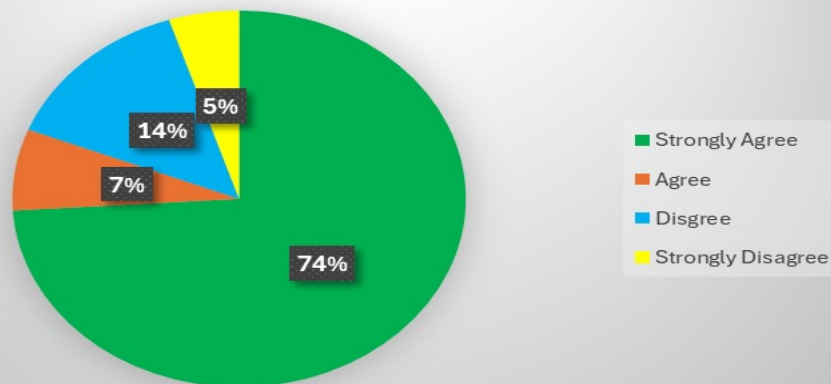
Importance of AI Learning



AI becomes Virtual Tutor & Smart Assistants



AI as an Alternative to Self-Learning



AI replacing Teachers / Lecturers

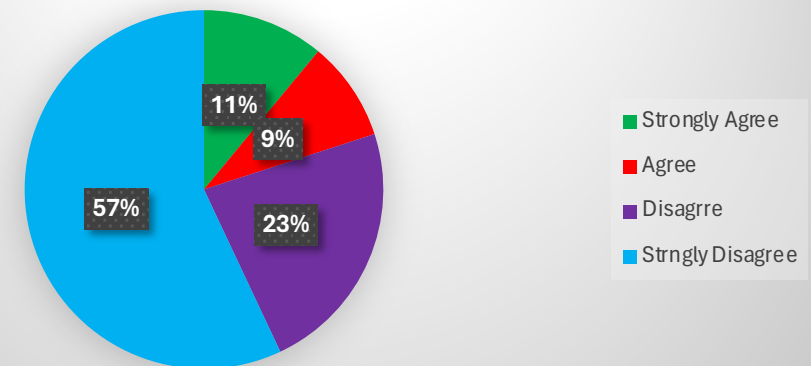


Table:

	Importance of AI Learning	AI as an Alternative to Self-Learning	AI becomes Virtual Tutor and Smart Assistant	AI can Replace Teachers / Lecturers
Strongly Agree	88%	74%	88%	11%
Agree	9%	7%	9%	9%
Disagree	2%	14%	2%	23%
Strongly Disagree	1%	5%	1%	57%

Code:

```
//-----Easy Questions-----
{"Solve the linear equation for (x): [3x + 5 = 17]", "x = 4", "x = 6"},
{"Find the slope of the line passing through the points (2, 4) and (6, 10).", "2", "1.5", "2.5"},
{"Write the equation of a line in slope-intercept form passing through the point (3, 5) with a slope of 2.", "y = 2x - 1", "y = 2x + 4", "y = 5x + 3"},
{"If the equation of a line is y = 2x - 1, what is the y-intercept?", "1", "-1", "2"},
{"Determine the x-intercept of the equation 4x + 2y = 8.", "(2,0)", "(0,2)", "(0,4)"},
//-----Medium Questions-----
{"Find the point of intersection for the system of equations y = 2x - 1 and y = x + 1", "(x = 3, y = 5)", "(x = 2, y = 3)", "(x = 4, y = 7)"},
{"Write the equation of a line parallel to y = 3x - 2 passing through the point (1, 4)", "y = 3x + 4", "y = 3x - 1", "y = 3x + 1"},
{"Determine the solution set for the system of inequalities x + y < 3 and y < 1.", "x < 3 , y < 1", "x < 1 , y < 3", "x > 3 , y < 1"},
{"Find the sum of the solutions to the system of equations: 2x + y = 5 and x - y = 2.", "2", "3", "4"},
{"Write the equation of a plane in standard form with the normal vector <1, -3, 2> passing through the point (2, -1, 3)", "x - 3y + 2z = 7", "x - 3y + 2z = 9", "x - 3y + 2z = 11"},
//-----Hard Questions-----
{"Find the eigenvalues of the matrix [2, -1], [4, -3]", "λ = 1, 2", "λ = -3, -4", "λ = -1, -2"},
{"Calculate the determinant of the matrix [3, -1, 2], [4, 1, 0], [2, -3, 1]", "2", "-1", "-2"},
{"Find the inverse of the matrix [1, 2], [3, 4]", "[4, -2], [-3, 1]", "[3, -2], [-1, 1]", "[-2, 1], [1.5, -0.5]"},
{"Solve the differential equation dy/dx = 2x - 3", "y = x^2 - 3", "y = x^2 - 3x + C", "y = 2x - 3"},
{"Find the global maximum or minimum of the function f(x) = x^3 - 3x^2 + 4 on the interval [-2, 4]", "Global minimum at x = 3, Global maximum at x = -2", "Global minimum at x = 3, Global maximum at x = 4"}
};
```

```
System.out.println("Ok lets Begin!");

for (int i = 0; i < quiz.length; i++) {
    String correctAnswer = answerKey[i];
    String[] currentQuestion = quiz[i];
    String answerText = AskQuestion(currentQuestion, correctAnswer);

    System.out.print("Answer: ");
    String myAnswer = scanner.next().toLowerCase().charAt(0) + "";

    if (myAnswer.equals(correctAnswer)) {
        System.out.println("Correct!\n");
        score++;
    } else {
        System.out.println("Sorry, but this is incorrect. The correct answer is " + answerText + ".\n");
    }
}

scanner.close();
System.out.println("Your final score is: " + score + "/" + quiz.length);
System.out.println("Come back whenever im literally open 24/7, 365.");
```

Code Results:

```
M3R00M/src/questions/Questions.java - Eclipse IDE
efactor Navigate Search Project Run Window Help
Questions.java Scanner.class
// Introduction between user and HM3R00M

Problems Debug Shell Console
+terminated- Questions [Java Application] C:\Users\mvere\p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64.17.0.10.v20240120-1143\jre\bin\javaw.exe (Apr 19, 2024, 12:51:11 PM - 12:52:25 PM) [pid: 6120]
Hi! Welcome to the HM3R00M virtual assistant! I am at your command, Let's start by telling me your name: Mj
Humm lets see... Ah I know that name Mj! The task that needs to be completed for you today is your Linear Equations Test provided by your professor.
When you are ready to begin say yes: yes
Ok lets Begin!
Solve the linear equation for (x): [3x + 5 = 17]
a) x = 4
b) x = 6
Answer: a
Correct!

Find the slope of the line passing through the points (2, 4) and (6, 10).
a) 2
b) 1.5
c) 2.5
Answer: a
Correct!

Write the equation of a line in slope-intercept form passing through the point (3, 5) with a slope of 2.
a) y = 2x - 1
b) y = 2x + 4
c) y = 5x + 3
Answer: b
Sorry, but this is incorrect. The correct answer is y = 2x - 1.

If the equation of a line is y = 2x - 1, what is the y-intercept?
a) 1
b) -1
c) 2
Answer: a
Sorry, but this is incorrect. The correct answer is -1.

Determine the x-intercept of the equation 4x + 2y = 8.
a) (2,0)
b) (0,2)
c) (0,4)
Answer: c
Sorry, but this is incorrect. The correct answer is (2,0).

Find the point of intersection for the system of equations y = 2x - 1 and y = x + 1
a) (x = 3, y = 5)
b) (x = 2, y = 3)
c) (x = 4, y = 7)
Answer: a
Correct!

Write the equation of a line parallel to y = 3x - 2 passing through the point (1, 4)
a) y = 3x + 4
b) y = 3x - 1
c) y = 3x + 1
Answer: b
Sorry, but this is incorrect. The correct answer is y = 3x + 1.

Determine the solution set for the system of inequalities x + y < 3 and y < 1.
a) x < 3, y < 1
b) x < 1, y < 3
c) x > 3, y < 1
Answer: b
Sorry, but this is incorrect. The correct answer is x < 3, y < 1.

Find the sum of the solutions to the system of equations 2x + y = 5 and x - y = 2.
a) 2
b) 3
c) 4
Answer: a
Sorry, but this is incorrect. The correct answer is 3.
```

```
M3R00M/src/questions/Questions.java - Eclipse IDE
efactor Navigate Search Project Run Window Help
Questions.java Scanner.class
// Introduction between user and HM3R00M

Problems Debug Shell Console
+terminated- Questions [Java Application] C:\Users\mvere\p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64.17.0.10.v20240120-1143\jre\bin\javaw.exe (Apr 19, 2024, 12:51:11 PM - 12:52:25 PM) [pid: 6120]
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Answer: a
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a) x < 3, y < 1
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Answer: b
Sorry, but this is incorrect. The correct answer is x < 3, y < 1.

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Find the sum of the solutions to the system of equations 2x + y = 5 and x - y = 2.
a) 2
b) 3
c) 4
Answer: a
Sorry, but this is incorrect. The correct answer is 3.

Write the equation of a plane in standard form with the normal vector <1, -3, 2> passing through the point (2, -1, 3)
a) x - 3y + 2z = 7
b) x - 3y + 2z = 9
c) x - 3y + 2z = 11
Answer: b
Sorry, but this is incorrect. The correct answer is x - 3y + 2z = 11.

Find the eigenvalues of the matrix [2, -1], [4, -3]
a) λ = 1, 2
b) λ = -3, -4
c) λ = -1, -2
Answer: a
Sorry, but this is incorrect. The correct answer is λ = -1, -2.

Calculate the determinant of the matrix [3, -1, 2], [4, 1, 0], [2, -3, 1]
a) 2
b) -1
c) -2
Answer: c
Sorry, but this is incorrect. The correct answer is -1.

Find the inverse of the matrix [1, 2], [3, 4]
a) [4, -2], [-3, 1]
b) [3, -2], [-1, 1]
c) [-2, 1], [1.5, -0.5]
Answer: c
Correct!

Solve the differential equation dy/dx = 2x - 3
a) y = x^2 - 3
b) y = x^2 - 3x + C
c) y = 2x - 3
Answer: b
Sorry, but this is incorrect. The correct answer is y = x^2 - 3x + C.
```

```
M3R00M/src/questions/Questions.java - Eclipse IDE
efactor Navigate Search Project Run Window Help
Questions.java Scanner.class
// Introduction between user and HM3R00M

Problems Debug Shell Console
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c) 2.5
Answer: a
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a) y = 2x - 1
b) y = 2x + 4
c) y = 5x + 3
Answer: b
Sorry, but this is incorrect. The correct answer is y = 2x - 1.

If the equation of a line is y = 2x - 1, what is the y-intercept?
a) 1
b) -1
c) 2
Answer: a
Sorry, but this is incorrect. The correct answer is -1.

Determine the x-intercept of the equation 4x + 2y = 8.
a) (2,0)
b) (0,2)
c) (0,4)
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Answer: a
Correct!

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c) y = 3x + 1
Answer: b
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Determine the solution set for the system of inequalities x + y < 3 and y < 1.
a) x < 3, y < 1
b) x < 1, y < 3
c) x > 3, y < 1
Answer: b
Sorry, but this is incorrect. The correct answer is x < 3, y < 1.

Find the sum of the solutions to the system of equations 2x + y = 5 and x - y = 2.
a) 2
b) 3
c) 4
Answer: a
Sorry, but this is incorrect. The correct answer is 3.

Calculate the determinant of the matrix [3, -1, 2], [4, 1, 0], [2, -3, 1]
a) 2
b) -1
c) -2
Answer: c
Sorry, but this is incorrect. The correct answer is -1.

Find the inverse of the matrix [1, 2], [3, 4]
a) [4, -2], [-3, 1]
b) [3, -2], [-1, 1]
c) [-2, 1], [1.5, -0.5]
Answer: c
Correct!

Solve the differential equation dy/dx = 2x - 3
a) y = x^2 - 3
b) y = x^2 - 3x + C
c) y = 2x - 3
Answer: a
Sorry, but this is incorrect. The correct answer is y = x^2 - 3x + C.

Find the global maximum or minimum of the function f(x) = x^3 - 3x^2 + 4 on the interval [-2, 4]
a) Global minimum at x = 3, Global maximum at x = -2
b) Global minimum at x = -2, Global maximum at x = 2
c) Global minimum at x = 1, Global maximum at x = -1
Answer: b
Sorry, but this is incorrect. The correct answer is Global minimum at x = 3, Global maximum at x = -2.

Your final score is: 4/15
Come back whenever im literally open 24/7, 365.
```


Language & Software Used:

- The Language that I based my code in was Java since that was the language that I was the most familiar with.
- The Software that I used to test and configure my code was the Eclipse IDE.



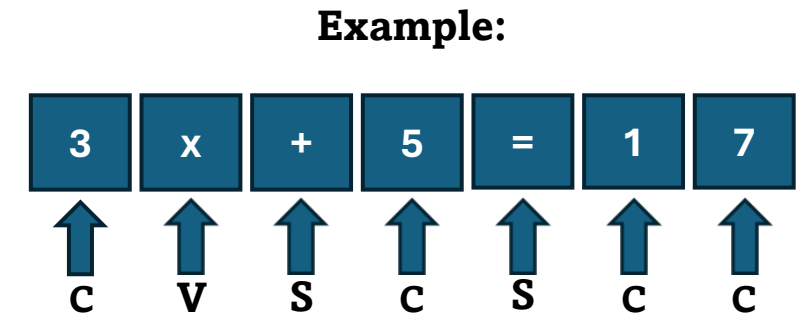
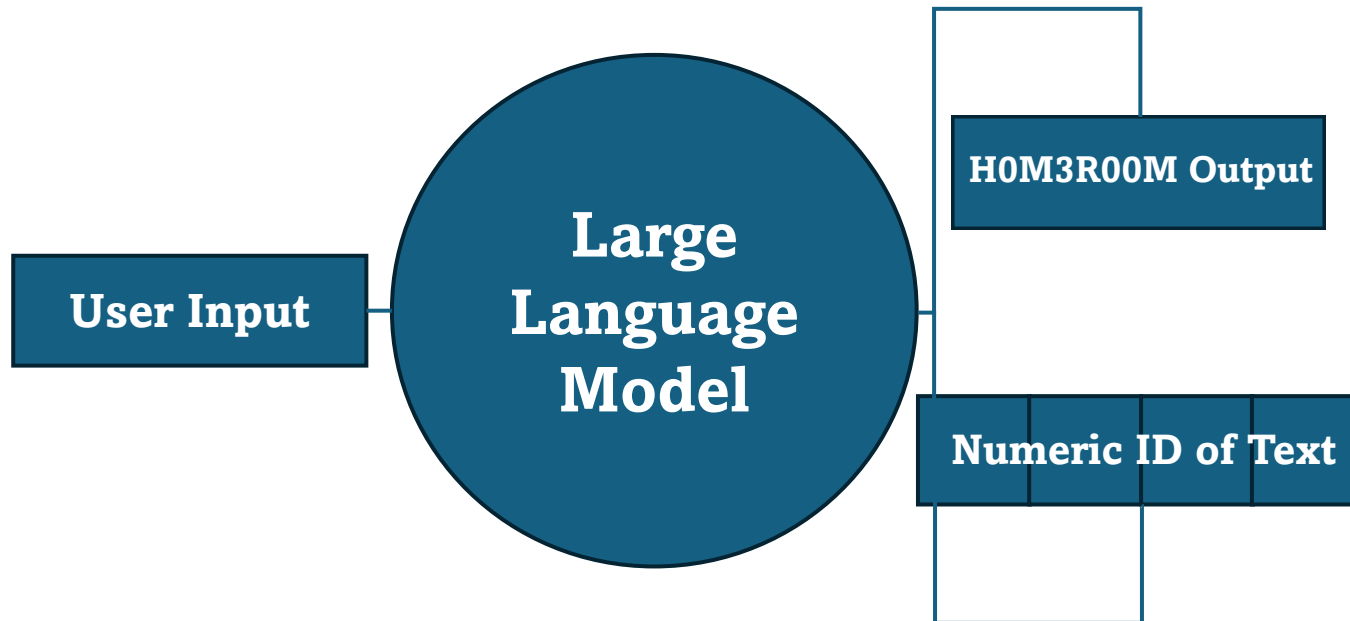
Virtual Assistant Functionality:

The functionality of my concept consist of a Large Language Model that specifically focuses on Mathematics.



It undergoes a process of acknowledging each variable and categorizing them to solve the provided problem.

H0M3R00M Cognitive Process:



C = Constant

V = Variable

S = Symbol

Methodology:

- For my study, I utilized a **Quantitative Research Methodology**, specifically focusing on a **Correlational Research Design** approach. My analysis was conducted by exploring the connecting concepts and ideas of different peer reviewed articles, all related to the same and or similar topics.
- Two examples of the data that I collected include the graphs presented and the responses to my research questions. Both of these components significantly contributed to shaping the framework of my research paper.

Research Answers:

1. Virtual Assistance could provide a benefit to this university and a lot of others by simply giving students better opportunities. For example, one of the few opportunities' students can gain from this incorporation would be making more courses accessible for students in current need of them. Removing the problems of university funding and unexpected instructor issues. (Henken, 2024)
2. The major differences / improvements that the assistance would bring to education would consist of resources such as personalized tutoring, adaptive learning experience, and instant feedback outside of the schooling environment. (Wishup, 2023)
3. The tutors influence students' overall learning outcome by creating individualized support. In the process of using the tool, students will overtime adapt to the forced self-aid practices that they will develop, changing their original perspective completely. (Das, 2024)
4. With time, it can expand to be more mobile than what it currently is. As the concept starts at code it will eventually gain...
 - The machine learning tools needed to incorporate AI within the base will be added.
 - It would get developed into a website so that it would become accessible for schools, teachers, and students.
 - It will soon after, get developed into an app to become more easily acceptable for users.

Future Intentions:

The intentions that I have for this concept in the future consist of...

- Incorporating the machine learning tools needed within the code to provide a thinking system for the concept.
- Enhancing the code and transforming it into a user-friendly website / app for improved accessibility.
- Securing approval from Universities and collaborating to promote the product to its intended target audience.
- Expanding beyond its current target environment, which is limited to this University, to reach not only other Universities but to also other sectors such as grades K – 12.

Reference Page:

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