Artificial Intelligence: A Teacher's Assistant and A Hero To All

Inclusive classrooms, according to an article by Friendship Circle, are classrooms that serve the purpose of trying to integrate all students, regardless of any characteristic, into one classroom according to Eredics. On the other end of the spectrum, there are self-contained classrooms that don't seek to integrate all students, but cater to a select population or just one person. Self-contained classrooms are present to acknowledge the crude reality that not all students can be put in a traditional classroom and be accounted for and are present for those reasons. Self-contained classrooms are meant, however, to slowly get a student used to the traditional classroom and when they are "ready," these students in the self-contained classrooms will now be a part of the inclusive setting. Inclusive classrooms treat individualized learning as a given and try to give the student exposure. While self-contained classrooms treat individualized learning as an absolute priority and address it through opening the classroom to only certain people to cater to only those people, inclusive classrooms teach via interaction view interaction with others as exposure to other perspectives. This is in contrast to self-contained classrooms, which tend to view it as a learning interruption in most cases(in some cases, social interaction is viewed as exposure if the teachers feel that the student is almost ready for an inclusive classroom and it is the ultimate goal). But, according to the NCES the US has around a 1:15 teacher to student ratio, meaning that inclusive classrooms are easier to maintain. One problem with the data is that it doesn't account for the regional fluctuations all over the United States that are present. For example, one county may have a surplus of teachers, while another can barely get enough to teach their students. The inclusive classrooms are meant to help those who are struggling. While they seem perfect, they are missing one element: individualized learning geared towards the students. While inclusive instruction aims for individualized education en

masse by putting responsibility on one teacher; the truth is that no instructor can adjust to every student, from the top student to the lowest student, if there are too many students who have to learn, which is something that teachers from overcrowded schools can relate to. This is one of the many criticisms of the American education system. So far, how inclusive and how individualized a classroom can be have generally been an inverse relationship, mostly via class size. However, a new technology that has emerged in the past decade can completely change the inverse relationship: Artificial Intelligence. **Mandating the implementation of Artificial Intelligence in education will revive community support for public schools, mitigate the teacher shortage, and further individualize student learning.**

Artificial Intelligence in education certainly has the potential to revive community support for public schooling. Recently, community support has decreased during the COVID-19 pandemic; support for alternative schooling, like homeschooling as an EdWeek.org article by Prothero and Samuels states, has increased mostly due to the pandemic. One of the reasons for this occurrence is that parents have been able to see students'motivation. Concerning this very subject, an article by AP News states:

> Marla Williams initially supported Chicago Public Schools' decision to instruct students online during the fall of 2020. Williams, a single mother, has asthma, as do her two children. While she was working, she enlisted her father, a retired teacher, to supervise her children's studies. Her father would log into his grandson's classes from his suburban home and try to monitor what was happening. But it didn't work. Her son lost motivation and wouldn't do his assignments. Once he went back on a hybrid schedule in spring 2021, he started doing well again, Williams said. "I wish we'd been in person earlier," she said. "Other schools seemed to be doing it successfully" (Toness and Gecker).

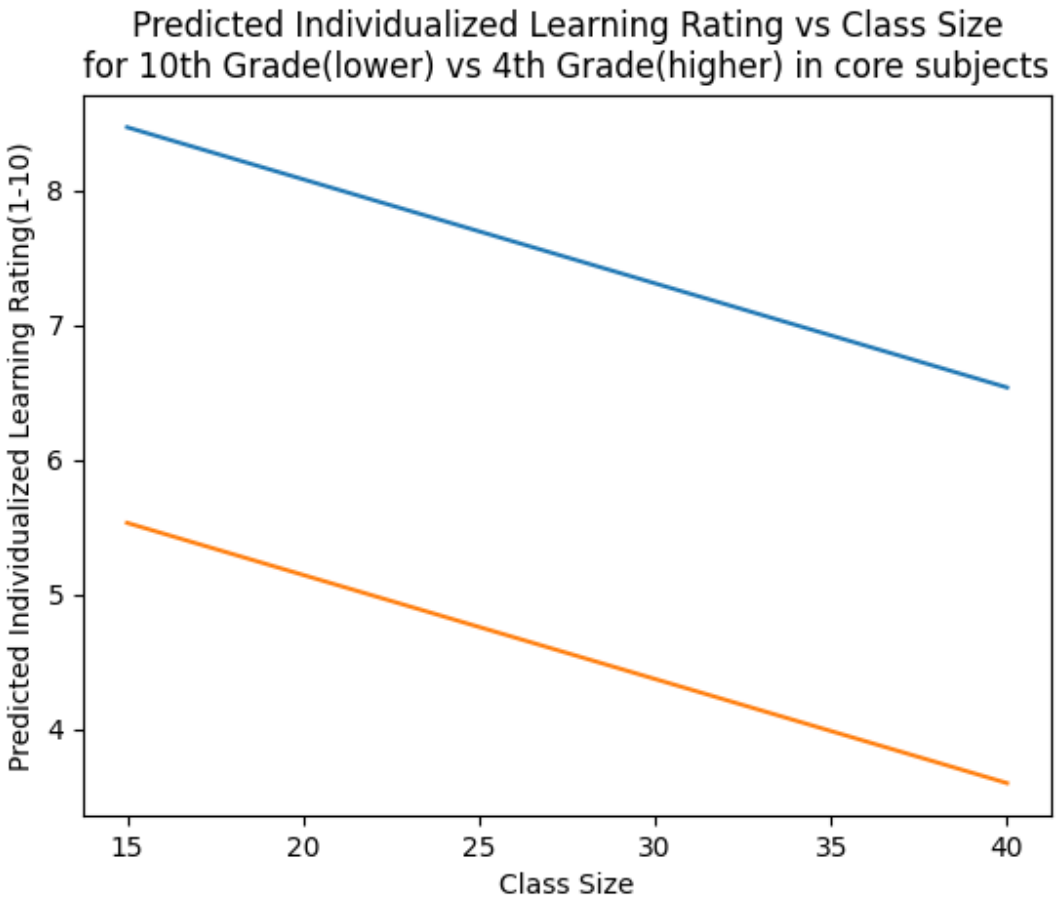
Historically, the lack of students'motivation has been present, but was during the pandemic seen to a much greater extent, which is highlighted in a New York Times article by Megan Jelinger. Additionally, the rise of alternative education, such as homeschooling, has led to declines in the enrollment of students in public schools that meet the cognitive and emotional needs of children, as stated in the previous quote. On top of the rise in alternative education, according to an IPSOS poll, many parents have reported that their child is falling behind: "Among the nearly one-third of parents who say their child has fallen behind in school due to the pandemic (32%)" (Newall and Diamond 1). The aforesaid quote is another facet of the declining community support for education. In contrast with the context of the previous quotes, the problems with education have, for the most part, originated from the pre-pandemic classrooms. The reason the collective community's preference for public schools have not been tumbling as quickly before the pandemic than during the pandemic was due to how busy many parents were according to an article by The Edvocate, written by Matthew Lynch. A solution to the problem is to increase parent involvement, which is integral to all the solutions stated in the EdWeek article parents are coping with their distaste of online learning. However, as parents are going back to work in the post-pandemic world, it will be hard for working parents to concentrate on their child's education, resulting in less attention towards their child's education. Increasing parental involvement is unrealistic due to work, meaning that a new solution is needed. Artificial Intelligence can account for the needs of every child without need for parent intervention, and if needed, the Artificial Intelligence can communicate with parents on their child's progress. According to a ProQuest article by Ahmad et al., Artificial Intelligence will be present at all times for any student, in contrast to the teacher might not be there all hours of the day to talk to them as they have their own things to do. This might help the students who were struggling in

the online classes to catch up, which will allow their parents to be more supportive of the public school system in place. Additionally, it will address concerns for parents who have moved their children out of public schools for concerns of education that suits their child. Moreover, if a child needs to contact a teacher, and they are not available and there is a test for the next class, and the teacher will not reply till then, Artificial Intelligence can help as it will be there to help the child at all times. When seeking to increase community support for public schooling, one shall consider the child, and how much support their parents will show based on their child's education and well being, or how they feel about a class. Artificial Intelligence can put the child's education and well being in a good place such that parents will, in general, be more supportive of public schooling.

Currently teacher shortages are being experienced by many areas of the United States, and Artificial Intelligence should be utilized to make sure that these shortages do not get exemplified, especially in areas hard hit by teacher shortages. According to a Wireless Communication and Networking Conference(WCNC) article by Nate Morabito article suggests to be a good teacher to student ratio of around 1:11 or 1:13, which means that Charlotte Mecklenburg School district is also facing a teacher shortage due to its teacher to student ratio, as stated by Morabito, is around 1:20 median for all grade levels, and this was in 2018. On top of that, concerning the overcrowding of schools, Morabito states:

> CMS' lobbyist said it would likely cost the district $175 million to build the necessary 200+ classrooms needed. Not only does the district not have the money, Jeter said it doesn't have the time to get it done by the deadline. If the state doesn't give CMS a delay and doesn't give the district funding, he said the only way the school system can comply is to overload even more classrooms in older grade levels (1).

However, one thing that this quote does not mention specifically is that in order to relieve a teacher shortage, teachers must be paid periodically, which will also add to the stated cost. Consequently, the district needs a more cost effective solution, or classrooms will be filled to the brim; that cost effective solution is Artificial Intelligence. Unlike teachers who would want to be paid and by law have to be paid, Artificial Intelligence does not have to be. While Artificial Intelligence simply can't replace teachers due to their inability to mimic certain human traits like empathy, it can certainly boost the productivity of teachers manyfold. This solution could also be applied in areas that have an extremely severe teacher shortage to mitigate the teacher shortage. However, the cost for electronics for each student to access an Artificial Intelligence could also be daunting for certain countries that do not have funds to give every student access to an electronic. However, to restate what was previously stated, Artificial Intelligence is less expensive in the long term due to the lack of labor costs.



Additionally, Morabito mentions how older students' classrooms will have to be overloaded in order to relieve the teacher shortage of the younger students' classrooms. According to the graph above based on data from a recent survey of teachers across the United States, tenth graders were considered to have a lower level of individualized learning compared to fourth graders, meaning that if tenth grade classrooms are overloaded, the already poor quality of individualized education will further decline due to the increase in the average class size. One way to allow for teachers to shift to the lower grade levels without hurting, and potentially improving the quality of education for tenth graders is to use Artificial Intelligence in tenth grade classrooms to allow for the transfer of teachers without the need to hire new teachers. When there is a teacher shortage, it is harder for the teacher to reach out to all students, but Artificial Intelligence can

adjust to each and every student, giving it another advantage over teachers as every student learning with an Artificial Intelligence is like each student having their own personal tutor. One question that is probably in the air is “why do the tenth grade classrooms have to use Artificial Intelligence and not the fourth graders?” While that question does account for how unnecessary it might be to support a “teacher migration” between grades when Artificial Intelligence can just be used in fourth grade to stop the migration, that question doesn’t account for something fourth graders need more than tenth graders. During an interview with Dr. Stacey J. Mahoney from North Carolina State University, who is the program director of their “AI Academy,” Dr. Mahoney stated: “While an orchestra can still perform in the absence of a conductor, it is the conductor who coordinates, facilitates, and creates the masterpiece. Without the conductor, the audience may just hear a bunch of noise. This could be said to be the role of teacher.” When a teacher is seen as a conductor, in a way, it makes sense allowing teachers to “migrate” to the lower grades. The older students can use Artificial Intelligence. One reason that the younger students should be given more teachers is because, according to frontiersin.org: “Teachers’ role includes planning of the setting for play, using a playful pedagogic approach, and engaging with children in play(Wood, 2008)” (Pinchover 1). The quote mentions how teachers need to engage the student’s playfulness, which applies to younger students and not to older students(10th grade), which is indicative of why there needs to be more teachers assigned in an elementary setting and more Artificial Intelligence led education in the upper grades. In other words, teachers can “create a masterpiece” from the playfulness of younger children which Artificial Intelligence cannot do, but they can assist tenth grade teachers in teaching their students. Artificial Intelligence should, therefore, be utilized in older students’ classrooms for the sole purpose of mitigating teacher shortages nationally and not to replace teachers outright.

Many streaming services today, based on one's data and one's alone, will recommend the best to one because of the way its Artificial Intelligence works to get them to watch the streaming service more. Likewise, Artificial Intelligence will use the student's data and only their data to successfully make sure a student has learned a certain concept by recommending certain lessons and tests to them to successfully complete mastery of the specified subject. Dr. Stacey Mahoney states: "With 40 (or more) students in a classroom, teachers often have to teach to the 'middle.' [Which can be too much for the 'lower students' to grasp, and too boring for the top students, who might just lose interest in school itself.] With the implementation of AI tools, each student can have the individualized instruction they need." Additionally, according to an article by ProQuest, the Artificial Intelligence that can be utilized in education can go further than just simple recommendations of tests based on mastery: "According to a systematic method, various calculations and analyses are performed on various types of teaching data in the data layer to realize intelligent processing of data. For example, by performing intelligent academic analysis on the behavioral data, basic information data, and academic data of all students in the class, it can obtain a portrait of the individual student and the class as a whole and provide different learning materials and different arrangements for the learners according to their learning interests. Difficult homework motivates learners' intrinsic motivation for learning. The service layer provides the required education services to users by receiving the data processing results from the algorithm layer" (Xue and Wang 1). For example, as the previous quote stated, a student's intrinsic motivation can be targeted through, as the article stated, difficult homework. If someone needs more than difficult homework however, that student can also be provided with additional materials like maybe a research paper that wants a student to go into depth about a certain subject in order to target other motivations like learning real world implications or maybe

trying to figure out a potential solution to an existing problem that has to do with the subject the student is currently learning. Additionally, there has been a decline in the test scores of students when it comes to English and Mathematics after students have come back to school after the Coronavirus pandemic. An article by NAEP states:

> "These are some of the largest declines we have observed in a single assessment cycle in 50 years of the NAEP program," USDOE acting associate commissioner Daniel McGrath said in a statement. … Students' scores have generally ticked upward since the 1970s, when the test was first administered, but in recent years the increases have waned slightly, per the Times. … "Unless we act over the next couple of years to reverse these losses, this will be the first significant widening of the racial achievement gap in 30 years," Thomas Kane, a Harvard economist who has done extensive research on the pandemic achievement loss, … Some of the decline in test scores was to be expected since so many students lost months of school during the pandemic. Even those students who did participate in remote learning were subject to emergency, poorly planned online learning classes that were not the equivalent of in-person instruction (Tony 1).

The huge declines mentioned in the article really show that the education system needs to innovate and come up with a way to catch up. Even in recent years, according to the article, there has been a decline in growth. While growth was still shown, it was less than it was in the past. Overall, it is clear that the modern education system doesn't work the way it should.According to the New York Times article by Megan Jelinger from December 2019, a student from Ohio criticized the public school system for not being, in a nutshell, individualized:

> "I've struggled in many classes, as of right now it's [the] government. What is making this class difficult is that my teacher doesn't really teach us anything, all he does is

> [show] us videos and give us papers that we have to look through a textbook to find. The problem with this is that not everyone has this sort of learning style. Then it doesn't help that the papers we do, we never go over so we don't even know if the answers are right."
>
> — S Weatherford, Kent Roosevelt, OH

According to the article, the public school system doesn't adapt to the method of learning that is used by some students. However, Artificial intelligence can solve this very problem. With declining test scores needing to be recovered and an education system that doesn't tune their lessons with every student, Artificial intelligence is a solution that can solve both problems. One question that still remains is who needs it the most. The answer: the older grades need it the most. Artificial intelligence can teach each student on an individual basis and fix problems with students unable to understand what to do, which will in turn, boost the average scores of American students as the years go on recovering pre-pandemic scores as well as growing beyond them.

In the classroom, Artificial Intelligence can be extremely beneficial for students, but it could also have its downsides. Using Artificial Intelligence, at least in the context of this article, is something that requires electronic access to use, especially for specialized learning. However, a computer itself is a major distraction. According to a teacher on an EdWeek article, students just go find the most fun thing to do: "'in trying to teach students to use technology, the greatest obstacle to their learning was the technology itself.' The moment he turned his back on a student, he or she would 'very quickly find the most fun they could find on the computer, computer games, and start playing them' (Wood, 2008)" (Klein 1). But, what this article doesn't take into account is that there are already systems in place to restrict students from going to certain

websites like DyKnow or Microsoft's parental controls that could be used in a school setting. These web applications could be used to block students from accessing these websites when they need to use Artificial Intelligence to learn. Hypothetically, Artificial Intelligence could be teaching children what may be considered inappropriate. Maybe if many parents don't want their children to learn about something that could be considered inappropriate for reasons that may be due to age or religion, that could cement some feelings against Artificial Intelligence that it is not listening to the parents. However, Artificial Intelligence, as stated before, could be communicative to the parents on what and how well their child is learning, and the parents can decide from there. Or possibly, they could give a goal to an Artificial Intelligence to teach the child about, for example, Christian Mythology. More importantly, concerning the digital divide, an article by Brookings Institution written by Andre Perry and Nicol Lee states: "Kids from Black and Latino or Hispanic communities—who are often already on the wrong side of the digital divide—will face greater inequalities if we go too far toward digitizing education without considering how to check the inherent biases of the (mostly white) developers who create AI systems." As one can tell by reading the quote, it seems that the digital divide will widen with innovation in the technological sector of education. Therefore, in order to ease the digital divide, one shall not restrict the technology from developing, but use it to allow the underserved communities access to better education. In order to implement Artificial Intelligence in schools without widening the digital divide, a solution proposed by Dr. Stacey Mahoney from North Carolina State University could be a potential solution:

> Perhaps [Artificial Intelligence enhanced education can be distributed] through a federal grant, so access to the tool could be equitable. Once a broad solution is in place, then

> focus on the underserved communities to help elevate that population of children. In a perfect world, [access to AI tools would be universal].

Basically, Artificial Intelligence enhanced education can be used to level the inequality between schools if proper steps are taken, like the proposed use of a federal grant to allow equitable access to Artificial Intelligence in the classroom. Overall, Artificial Intelligence, if utilized properly, can greatly improve education with the benefits greatly outshining the drawbacks of such technology enhanced education, especially when it comes to easing the "education inequality" or communicating with parents.

The sheer amount of problems that the education system faces is an implicit call for the use of a new method to fix its problems, and that new method is by using Artificial Intelligence. Every day, American students are facing progressively worse educational standards and have to cope with the lack of teachers, which can affect their learning. Public education needs to consider the modernization of education in order to maximize teacher productivity, which can be done through Artificial Intelligence. In response to the movements desiring for greater equality in America during the latter half of the twentieth century, public education introduced measures to make classrooms more inclusive for those who may be behind educationally, hence the term "inclusive classrooms". Meaning in response to the revelation of the incompetence of the public education system's ability to respond to the declining quality of public education, there needs to be a reformation of the system. The key to reforming the system is not an even more inclusive classroom, but a new solution with new technology. Hence, Artificial Intelligence's use should be mandated in every classroom.

Works Cited

Atske, Sara, and Andrew Perrin.

"https://www.pewresearch.org/Fact-Tank/2021/07/16/Home-Broadband-Adoption-Computer-Ownership-Vary-by-Race-Ethnicity-in-the-u-s/." Pew Research Center, Pew Research Center, 16 July 2021, www.pewresearch.org/fact-tank/2021/07/16/home-broadband-adoption-computer-ownership-vary-by-race-ethnicity-in-the-u-s/.

Eredics, Nicole. "5 Ways Inclusive Classrooms Are Different from Self-Contained Classrooms." Friendship Circle, Friendship Circle, 21 Nov. 2016, www.friendshipcircle.org/blog/2016/11/21/inclusive-classrooms-vs-self-contained-classrooms/.

Jelinger, Megan. "What Students Are Saying about How to Improve American Education." The New York Times, The New York Times, 19 Dec. 2019, www.nytimes.com/2019/12/19/learning/what-students-are-saying-about-how-to-improve-american-education.html.

Klein, Alyson. "Three Reasons to Be Skeptical of Artificial Intelligence in Schools." *Education Week*, Education Week, 18 Nov. 2020, www.edweek.org/technology/three-reasons-to-be-skeptical-of-artificial-intelligence-in-schools/2020/02.

Lynch, Matthew. "18 Reasons the U.S. Education System Is Failing." The Edvocate, The Edvocate, 3 Apr. 2017, www.theedadvocate.org/10-reasons-the-u-s-education-system-is-failing/.

Morabito, Author: Nate. "Charlotte Schools Are Overcrowded and It Might Get Worse Soon."

Wcnc.com, WCNC, 21 Aug. 2019, www.wcnc.com/article/news/education/charlotte-elementary-schools-are-overcrowded-and-the-fix-could-make-it-worse-for-older-kids/275-1c839a3d-54fc-44ff-ac8e-5241b9a14d1c.

Newall, Mallory, and James Diamond. "Parents Report Improvements in Their Child's Educational ... - Ipsos." *IPSOS*, IPSOS, 29 Apr. 2022, www.ipsos.com/en-us/news-polls/NPR-Ipsos-Parent-Child-Education-04282022.

Perry, Andre M., and Nicol Turner Lee. "Ai Is Coming to Schools, and If We're Not Careful, so Will Its Biases." Brookings, Brookings Institute, 9 Mar. 2022, www.brookings.edu/blog/the-avenue/2019/09/26/ai-is-coming-to-schools-and-if-were-not-careful-so-will-its-biases/.

Pinchover, Shulamit. "The Relation between Teachers' and Children's Playfulness: A Pilot Study." *Frontiers*, Frontiers, 1 Jan. 1AD, www.frontiersin.org/articles/10.3389/fpsyg.2017.02214/full.

Prothero, Arianna, and Christina A. Samuels. "Home Schooling Is Way up with Covid-19. Will It Last?" *Education Week*, Education Week, 31 Jan. 2022, https://www.edweek.org/policy-politics/home-schooling-is-way-up-with-covid-19-will-it-last/2020/11

Sayed, Fayaz A., et al. "Artificial Intelligence and its Role in Education." Sustainability, vol. 13,

no. 22, 2021, pp. 12902. ProQuest, https://ezproxy.cpcc.edu/login?url=https://www.proquest.com/scholarly-journals/artificial-intelligence-role-education/docview/2602261315/se-2, doi:https://doi.org/10.3390/su132212902.

Toness, Bianca Vazquez, and Jocelyn Gecker. “Online School Put US Kids behind. Some Adults Have Regrets.” *AP NEWS*, AP NEWS, 21 Oct. 2022, apnews.com/article/online-school-covid-learning-loss-7c162ec1b4ce4d5219d5210aaac8f1ae.

Wood, Elizabeth. "Developing a pedagogy of play." Early childhood education: Society and culture (2009): 27-38.

Xue, Yajing, and Yijun Wang. "Artificial Intelligence for Education and Teaching." Wireless Communications & Mobile Computing (Online), vol. 2022, 2022. ProQuest, https://ezproxy.cpcc.edu/login?url=https://www.proquest.com/scholarly-journals/artificial-intelligence-education-teaching/docview/2648812776/se-2, doi:https://doi.org/10.1155/2022/4750018.

Mahoney, Stacey. Personal Interview. November 8, 2022.