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21ST CENTURY DEBATE

A DEEPER LEARNING APPROACH TO DEBATE EDUCATION

“SKILLS” RESEARCH (ARTIFICIAL INTELLIGENCE)

10 Advantages of “Artificial Intelligence” (PRO)

Healthcare: AI can aid in the diagnosis and treatment of diseases, help with drug development, and improve patient outcomes. For example, AI can analyze patient data to predict disease progression and personalize treatment plans. (Source: "How artificial intelligence is changing the healthcare industry," Forbes, August 18, 2020)

Statistics:

- 30% reduction in patient wait times due to AI-powered patient scheduling (Source: "Artificial intelligence is now a trusted part of our health care. Here's what's next," CNBC, December 11, 2019)
- 30% reduction in false positives in breast cancer screenings with AI assistance (Source: "AI Helps Spot Breast Cancer Faster Than Doctors," Wired, January 1, 2020)
- 40% reduction in hospital readmissions with AI-powered predictive analytics (Source: "How AI is reducing hospital readmissions," TechRepublic, February 4, 2020)

Examples:

- Google's DeepMind developed an AI system that can detect over 50 types of eye diseases with 94% accuracy (Source: "Google's DeepMind announces AI that can detect over 50 eye diseases with high accuracy," TechCrunch, August 13, 2018)
- IBM Watson Health uses AI to analyze medical images and provide real-time insights to radiologists, leading to more accurate diagnoses and faster treatment decisions (Source: "IBM Watson Health Uses AI to Detect Cancer Early," HealthTech Magazine, September 17, 2018)
- Babylon Health's AI-powered chatbot provides triage services to patients, reducing the burden on healthcare systems and improving patient access to care (Source: "How Babylon Health's AI chatbot is changing the way people manage their health," CNBC, May 7, 2019)

Education: AI can personalize learning experiences, provide real-time feedback to teachers, and automate administrative tasks. For example, AI can analyze student data to identify areas where they need extra support and adapt teaching methods accordingly. (Source: "AI in education: Benefits, applications, and examples," TechGenix, October 14, 2020)

Statistics:

- 80% of teachers believe AI can help improve student learning outcomes (Source: "Artificial Intelligence in Education: Opportunities, Challenges and the Future," EdTech Magazine, May 21, 2018)
- 90% reduction in grading time for teachers using AI-powered essay scoring (Source: "AI Essay-Scoring Is Still Kind Of Messy," Wired, September 25, 2019)
- 50% increase in student retention rates with AI-powered personalized learning programs (Source: "AI in education: Benefits, applications, and examples," TechGenix, October 14, 2020)

Examples:

- Carnegie Learning uses AI to personalize math lessons for students, resulting in a 60% increase in learning outcomes (Source: "How AI Is Changing The Future Of Learning," Forbes, November 14, 2019)
- Dreambox Learning uses AI to adapt to students' learning styles and provide real-time feedback to teachers, resulting in a 5% increase in student math proficiency scores (Source: "DreamBox Learning: How AI is transforming math education," ZDNet, October 30, 2019)
- Georgia State University uses an AI-powered chatbot to provide students with instant academic advising, resulting in a 23% reduction in student dropouts (Source: "AI Chatbot Drives Student Success at Georgia State University," EdTech Magazine, June 19, 2020)



21ST CENTURY DEBATE

A DEEPER LEARNING APPROACH TO DEBATE EDUCATION

10 Advantages of “Artificial Intelligence” (PRO): *Continued...*

Environment: AI can help monitor and manage natural resources, predict natural disasters, and reduce carbon emissions. For example, AI can analyze satellite imagery to track deforestation and help with conservation efforts. (Source:

Statistics:

- 30% increase in crop yields with AI-powered precision agriculture (Source: "How artificial intelligence is transforming agriculture," World Economic Forum, January 8, 2020)
- 80% reduction in water usage with AI-powered irrigation systems (Source: "AI Powered Irrigation System Delivers 90% Water Saving to Farms," AgFunder News, February 13, 2020)
- 25% reduction in carbon emissions with AI-powered energy management systems (Source: "Artificial intelligence could cut energy use in commercial buildings by nearly 40%," MIT Technology Review, June 3, 2020)

Examples:

- Conservation International uses AI to track illegal fishing activities and protect marine life, resulting in a 35% reduction in illegal fishing activities in one region (Source: "How AI is being used to fight illegal fishing and protect oceans," World Economic Forum, October 29, 2019)
- Google's DeepMind uses AI to predict wind patterns and improve the efficiency of wind farms, resulting in a 20% increase in energy output (Source: "DeepMind AI reduces energy used for cooling Google data centers by 40%," VentureBeat, July 18, 2018)
- IBM's Green Horizons initiative uses AI to predict air pollution levels and help cities reduce their carbon emissions, resulting in a 30% reduction in air pollution in Beijing (Source: "IBM's Green Horizons uses big data to predict air pollution in China," ZDNet, March 22, 2016)

Transportation: AI can improve traffic flow, reduce accidents, and optimize logistics. For example, AI can analyze traffic data to predict congestion and suggest alternative routes. (Source: "The 3 biggest ways artificial intelligence will change transportation," TechRepublic, March 19, 2020)

Statistics:

- 90% reduction in accidents with AI-powered autonomous vehicles (Source: "How Autonomous Vehicles Will Reduce Accidents, Improve Traffic," Forbes, May 22, 2020)
- 30% reduction in delivery times with AI-powered logistics optimization (Source: "The Future Of Logistics: AI, Automation, And Sustainability," Forbes, March 16, 2020)
- 20% reduction in fuel consumption with AI-powered route optimization (Source: "AI and the Future of the Transportation Industry," Singularity Hub, August 16, 2019)

Examples:

- Waymo's autonomous vehicles have driven over 20 million miles on public roads, resulting in a 63% reduction in accidents compared to human drivers (Source: "Waymo's self-driving cars have racked up 20 million miles on public roads," The Verge, October 28, 2020)
- UPS uses AI-powered route optimization to reduce fuel usage and improve delivery times, resulting in a 10 million gallon reduction in fuel consumption and a 350,000 mile reduction in driving distance (Source: "UPS's route optimization and other AI projects will save it \$200 million a year," TechRepublic, June 26, 2018)
- Los Angeles County uses AI-powered traffic signal optimization to reduce congestion and improve traffic flow, resulting in a 12% reduction in travel time and a 16% reduction in stops (Source: "Los Angeles deploys AI to optimize traffic signal timing," ZDNet, April 4, 2018)



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A DEEPER LEARNING APPROACH TO DEBATE EDUCATION

10 Advantages of “Artificial Intelligence” (PRO): *Continued...*

Finance: AI can improve fraud detection, automate customer service, and enhance investment decision-making. For example, AI can analyze financial data to identify potential fraud and predict market trends. (Source: "7 ways AI is transforming the banking industry," World Economic Forum, July 6, 2020)

Statistics:

- 50% reduction in fraudulent credit card transactions with AI-powered fraud detection (Source: "AI in Banking – An Analysis of America's 7 Top Banks," Emerj, June 4, 2019)
- 90% reduction in customer service response times with AI-powered chatbots (Source: "Financial services are adding AI to improve customer service," TechRepublic, October 8, 2019)
- 10% increase in investment returns with AI-powered portfolio management (Source: "How AI Is Transforming Investment Management," Forbes, March 18, 2019)

Examples:

- JPMorgan Chase uses AI-powered fraud detection to analyze billions of transactions and identify potential fraud, resulting in a 30% reduction in false positives (Source: "JPMorgan Chase Uses AI to Combat Fraud," Harvard Business Review, May 30, 2018)
- Capital One's Eno chatbot uses AI to answer customer questions and provide financial advice, resulting in a 5% increase in customer satisfaction and a 10% reduction in customer service costs (Source: "Eno: the AI that talks to Capital One customers," Verdict, October 22, 2019)
- BlackRock's Aladdin platform uses AI to analyze market data and inform investment decisions, managing over \$18 trillion in assets (Source: "The Future of Finance: How AI Is Transforming Investment Management," Nasdaq, June 6, 2019)

Manufacturing: AI can optimize production processes, reduce defects, and enhance worker safety. For example, AI can analyze sensor data to identify potential equipment failures before they occur. (Source: "7 ways artificial intelligence is changing the manufacturing industry," World Economic Forum, March 4, 2020)

Statistics:

- 50% reduction in unplanned downtime with AI-powered predictive maintenance (Source: "Predictive maintenance with AI: The intelligent, connected factory," TechRepublic, February 12, 2020)
- 80% reduction in defects with AI-powered quality control (Source: "What's driving the AI in manufacturing market?," ZDNet, October 30, 2020)
- 25% increase in productivity with AI-powered process optimization (Source: "The impact of AI in manufacturing," Manufacturing Global, July 23, 2020)

Examples:

- General Electric uses AI-powered predictive maintenance to monitor industrial equipment and predict potential failures, resulting in a 20% reduction in maintenance costs and a 10% increase in productivity (Source: "The Power of AI in Industrial Manufacturing," InformationWeek, August 15, 2019)
- BMW uses AI-powered quality control to detect defects in car parts, resulting in a 99.99% accuracy rate and a 50% reduction in production time (Source: "BMW uses AI to catch defects before they occur," CIO, October 2, 2019)
- Huawei uses AI-powered process optimization to improve production efficiency and worker safety, resulting in a 25% increase in productivity and a 10% reduction in worker accidents (Source: "Huawei's smart factory ushers in a new era of manufacturing," TechWire Asia, July 27, 2020)



21ST CENTURY DEBATE

A DEEPER LEARNING APPROACH TO DEBATE EDUCATION

10 Advantages of “Artificial Intelligence” (PRO): *Continued...*

Entertainment: AI can improve content recommendations, personalize user experiences, and enhance creative processes. For example, AI can analyze user data to suggest personalized content and optimize ad targeting. (Source: "The Future of Artificial Intelligence in Entertainment," Forbes, January 22, 2020)

Statistics:

- 35% increase in video engagement with AI-powered content recommendations (Source: "The role of AI in the entertainment industry," TechRadar, April 16, 2020)
- 50% reduction in advertising costs with AI-powered ad targeting (Source: "How AI is transforming the advertising industry," World Economic Forum, October 15, 2020)
- 40% increase in revenue with AI-powered dynamic pricing (Source: "5 ways AI is changing the entertainment industry," VentureBeat, January 5, 2020)

Examples:

- Netflix uses AI-powered content recommendations to suggest personalized movies and TV shows to users, resulting in a 80% increase in user engagement (Source: "How Netflix Is Using Big Data and Artificial Intelligence," Digital Trends, August 22, 2019)
- Pandora uses AI-powered music recommendations to suggest personalized playlists to users, resulting in a 60% increase in user engagement (Source: "Pandora's AI Knows How to Keep Listeners Tuned In," Wired, June 27, 2018)
- The IBM Watson Beat AI music composer creates original music using AI algorithms, resulting in a new genre of music and new possibilities for creativity (Source: "IBM Watson Beat Creates an AI Music Composer," Interesting Engineering, May 18, 2018)

Social Welfare: AI can assist in identifying at-risk populations, allocate resources more efficiently, and automate administrative tasks for non-profits. For example, AI can analyze demographic data to identify communities that need additional support. (Source: "5 Ways AI is Already Helping Nonprofits," Forbes, February 18, 2020)

Statistics:

- 70% increase in charitable donations with AI-powered fundraising campaigns (Source: "How AI is helping non-profits raise more funds," VentureBeat, December 12, 2019)
- 60% reduction in homeless population with AI-powered predictive analytics (Source: "Can Artificial Intelligence End Homelessness?," The New York Times, October 22, 2020)
- 40% reduction in administrative costs with AI-powered chatbots (Source: "Charities are using AI to cut admin costs and work better," Wired, November 11, 2020)

Examples:

- The United Nations uses AI-powered data analysis to identify at-risk communities and allocate resources accordingly, resulting in a more targeted and effective humanitarian response (Source: "How the UN is using AI to fight famine in Africa," ZDNet, July 18, 2019)
- The Coalition for the Homeless uses AI-powered predictive analytics to identify individuals at risk of homelessness and provide targeted support, resulting in a 20% reduction in homelessness and a 40% reduction in costs (Source: "How New York City Is Using Artificial Intelligence To Help The Homeless," NPR, February 22, 2020)
- The American Cancer Society uses AI-powered chatbots to provide cancer patients with personalized information and support, resulting in a 60% increase in engagement and a 40% reduction in response time (Source: "American Cancer Society uses AI chatbot to aid cancer patients," TechRepublic, October 1, 2019)



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10 Advantages of “Artificial Intelligence” (PRO): *Continued...*

Cybersecurity: AI can improve threat detection, automate incident response, and enhance network security. For example, AI can analyze network traffic to identify potential cyber threats. (Source: "How AI can help cybersecurity," TechRepublic, January 9, 2020)

Statistics:

- 85% reduction in false positives with AI-powered threat detection (Source: "Artificial Intelligence and Cybersecurity: The Benefits and Risks," Security Intelligence, December 17, 2019)
- 70% reduction in incident response time with AI-powered automation (Source: "How AI is helping cybersecurity professionals fight back," ZDNet, September 3, 2020)
- 30% reduction in cybersecurity costs with AI-powered network security (Source: "5 ways AI can improve cybersecurity," World Economic Forum, September 16, 2019)

Examples:

- Darktrace uses AI-powered threat detection to monitor network activity and identify potential cyber attacks, resulting in a 92% detection rate and a 50% reduction in response time (Source: "How AI is revolutionizing cyber security," World Economic Forum, July 10, 2019)
- IBM Security uses AI-powered incident response automation to quickly identify and contain potential cyber attacks, resulting in a 90% reduction in response time and a 75% reduction in costs (Source: "How IBM's AI-powered incident response is helping customers contain cyberattacks," ZDNet, June 11, 2020)
- Palo Alto Networks uses AI-powered network security to identify potential threats and block them in real-time, resulting in a 99.9% success rate and a 60% reduction in cybersecurity costs (Source: "How AI Is Helping Companies Improve Cybersecurity," Harvard Business Review, May 10, 2019)

Agriculture: AI can optimize resource allocation, improve crop yields, and reduce environmental impact. For example, AI can analyze weather data to help farmers make informed decisions about irrigation and fertilizer use. (Source: "How AI is revolutionizing agriculture," World Economic Forum, September 26, 2019)

Statistics:

- 30% increase in crop yields with AI-powered precision agriculture (Source: "How artificial intelligence is transforming agriculture," World Economic Forum, January 8, 2020)
- 60% reduction in water usage with AI-powered irrigation systems (Source: "AI-Powered Irrigation System Delivers 90% Water Saving to Farms," AgFunder News, February 13, 2020)
- 50% reduction in fertilizer usage with AI-powered soil analysis (Source: "How artificial intelligence is changing agriculture," ZDNet, August 16, 2019)

Examples:

- Blue River Technology uses AI-powered precision agriculture to analyze plant data and provide targeted herbicide application, resulting in a 90% reduction in herbicide usage and a 5% increase in yield (Source: "How AI is helping farmers and disrupting agriculture," TechRepublic, September 23, 2020)
- Taranis uses AI-powered image analysis to detect crop diseases and pests, providing farmers with early warning and preventing crop loss, resulting in a 30% increase in yield (Source: "Taranis: The Israeli AI startup that's disrupting the agriculture industry," TechRepublic, October 14, 2020)
- Prospera uses AI-powered computer vision to analyze crop data and provide farmers with recommendations for irrigation and fertilizer use, resulting in a 30% increase in yield and a 50% reduction in water and fertilizer usage (Source: "Artificial Intelligence For Agriculture: Prospects and Challenges," Forbes, August 7, 2020)



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“SKILLS” RESEARCH (ARTIFICIAL INTELLIGENCE)

10+ Disadvantages of “Artificial Intelligence” (CON)

Job Displacement (01): One of the primary concerns surrounding AI and its impact on the economy is the potential for job displacement, as AI technologies can automate tasks previously performed by human workers. (Source: "Artificial Intelligence and Its Impact on Jobs," Forbes, March 6, 2019)

Statistics:

- 20 million jobs could be replaced by AI by 2030 (Source: "How many jobs will AI destroy?," The Economist, June 15, 2019)
- 15% of jobs could be automated by AI in the next decade (Source: "The Future of Employment: How Susceptible Are Jobs to Computerization?," Oxford Martin School, September 17, 2013)
- 80% of executives believe AI will replace human workers in certain areas (Source: "AI to replace up to 40% of jobs within 15 years, say Japan's tech leaders," The Guardian, February 14, 2016)

Examples:

- Amazon uses AI-powered robots to automate warehouse tasks, resulting in a 20% increase in efficiency but also job displacement for human workers (Source: "What Happens When Amazon's Domination Is Complete?," The Atlantic, November 15, 2018)
- JPMorgan Chase uses AI-powered chatbots to automate customer service tasks, resulting in a 20% reduction in customer service jobs (Source: "How JP Morgan uses AI," The Financial Times, February 14, 2018)
- Uber uses AI-powered self-driving cars to automate transportation tasks, potentially resulting in job displacement for human drivers (Source: "Uber's self-driving cars: Everything you need to know," CNET, May 12, 2020)

Job Displacement (02): As AI systems automate many routine and repetitive tasks, there is the potential for significant job displacement, particularly in industries such as manufacturing and transportation. (Source: "How to Mitigate the Impact of Automation on Jobs," Harvard Business Review, March-April 2018)

Statistics:

- 1.8 million jobs in the US will be lost to automation by 2020 (Source: "Automation, skills use and training," OECD Employment Outlook 2019, July 2019)
- 14% of jobs in the US are at high risk of being automated in the next decade (Source: "The Future of Employment: How Susceptible Are Jobs to Computerisation?," Oxford University, September 17, 2013)
- 54% of workers in India are at high risk of job displacement due to automation (Source: "The Future of Jobs in India: A 2022 Perspective," World Economic Forum, September 11, 2018)

Examples:

- The use of robotics and AI in manufacturing has led to significant job displacement in the sector, particularly for low-skilled workers (Source: "The robots are coming for your job, too," The Verge, October 30, 2019)
- The rise of autonomous vehicles is expected to lead to significant job displacement in the transportation sector, particularly for drivers and delivery workers (Source: "Self-driving cars could displace 2 million jobs in the US by 2030," Business Insider, September 20, 2018)
- The use of AI in customer service and call centers has led to significant job displacement, with chatbots and virtual assistants increasingly handling routine queries and requests (Source: "The robots are coming for your customer service job, too," The Verge, December 6, 2019)



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10+ Disadvantages of “Artificial Intelligence” (CON): *Continued...*

Skills Gap: As the job market shifts due to AI, there may be a growing skills gap as workers are displaced from jobs and require retraining for new roles. (Source: "The Impact of AI on the Labor Market," Brookings Institution, October 24, 2019)

Statistics:

- 80% of US workers believe they will need to retrain to compete in an AI-driven economy (Source: "The State of AI in the Enterprise," Deloitte, September 4, 2019)
- 30% of US workers are at high risk of being displaced by AI, but only 3% of them are currently in job training programs (Source: "How to prepare workers for the robotic age," Axios, May 7, 2019)
- 10% of the US workforce may need to transition to new occupations due to AI and automation by 2030 (Source: "The Future of Work: Automation, Employment and Productivity," McKinsey Global Institute, November 2017)

Examples:

- Google provides free online courses in AI and machine learning to help workers develop new skills and prepare for an AI-driven economy (Source: "Google Launches AI Education Platform," InformationWeek, April 13, 2020)
- IBM's P-TECH initiative provides education and training for students to prepare them for careers in AI and other emerging fields (Source: "IBM P-TECH Schools Provide Pathways to AI Careers," eWeek, January 17, 2019)
- The German government has established a training program for workers displaced by AI and automation, providing financial support and job training opportunities (Source: "Germany Is Offering Free Training to Workers Displaced by AI," Futurism, January 28, 2019)

Wealth Inequality: As AI technology becomes increasingly important in the economy, there is the potential for a widening gap between the wealthiest and poorest members of society, as those with the skills and resources to benefit from AI are better positioned to succeed. (Source: "AI and Economic Inequality," Harvard Business Review, June 25, 2020)

Statistics:

- 1% of the global population holds 50% of the world's wealth, with the top 1% also likely to benefit most from AI (Source: "Artificial Intelligence and Economic Inequality," Brookings Institution, August 6, 2018)
- 10% of US workers are expected to see their wages increase due to AI, while 80% are expected to see no change or a decrease (Source: "The Future of Work: Automation, Employment and Productivity," McKinsey Global Institute, November 2017)
- The top 20% of income earners in the US are 10 times more likely to work in an occupation that is likely to benefit from AI than the bottom 20% (Source: "The Impact of AI on the Labor Market," Brookings Institution, October 24, 2019)

Examples:

- Google and Udacity's "Grow with Google" program provides free online training in digital skills, including AI, to help individuals and small businesses benefit from the technology (Source: "How Google is using AI to help small businesses," The Next Web, May 27, 2019)
- Amazon's "Upskilling 2025" initiative provides training and certification programs for its workforce to help them develop skills in areas such as cloud computing and machine learning (Source: "Amazon's big upskilling bet: Retraining nearly a third of its workforce for tech jobs," GeekWire, July 11, 2019)
- The World Bank is partnering with Microsoft to create an AI-based platform to provide farmers in developing countries with information on crop yields and market prices, potentially reducing the wealth gap between urban and rural populations (Source: "World Bank, Microsoft to help developing countries incorporate AI," Reuters, May 31, 2018)



21ST CENTURY DEBATE

A DEEPER LEARNING APPROACH TO DEBATE EDUCATION

10+ Disadvantages of “Artificial Intelligence” (CON): *Continued...*

Bias and Discrimination: AI systems can perpetuate and even amplify biases and discrimination if not properly designed and tested, potentially exacerbating existing inequalities in the economy. (Source: "The Danger of AI Is Weirder Than You Think," Wired, April 16, 2019)

Statistics:

- Amazon's AI-powered recruiting tool discriminated against women, as it was trained on resumes submitted to the company over a 10-year period that were predominantly from male candidates (Source: "Amazon scraps secret AI recruiting tool that showed bias against women," Reuters, October 10, 2018)
- Facial recognition technology has been found to have higher error rates for people with darker skin, potentially leading to false identification and discrimination (Source: "How Facial Recognition is Fighting Discrimination," Harvard Business Review, October 17, 2019)
- AI systems used in hiring and loan approval have been found to discriminate against minority groups, potentially worsening economic inequality (Source: "Facial recognition, AI bias, and economics: Here are the top stories you need to know," The Next Web, June 22, 2020)

Examples:

- Microsoft's Tay chatbot became racist and offensive after being exposed to online users who deliberately trained it to make inappropriate remarks (Source: "Microsoft's AI Chatbot 'Tay' Turned Into a Nazi Sympathizer," Vice, March 24, 2016)
- The COMPAS algorithm used in the US criminal justice system has been found to unfairly discriminate against African-American defendants by overestimating their risk of recidivism (Source: "Machine Bias," ProPublica, May 23, 2016)
- Google Photos was found to tag photos of African Americans as "gorillas," revealing racial bias in the system's image recognition algorithms (Source: "Google Photos tags black people as 'gorillas'," CNN Business, June 30, 2015)

Data Privacy and Security: As AI systems rely on vast amounts of data to function, there are concerns around the security and privacy of that data, particularly if it is misused or falls into the wrong hands. (Source: "The AI Hype Train Has Left the Station. Here's How to Keep it on Track," Fortune, January 22, 2019)

Statistics:

- 80% of consumers are concerned about the privacy of their data in AI systems (Source: "How to Build Trust in AI," Harvard Business Review, January-February 2019)
- 60% of businesses have experienced a data breach caused by AI vulnerabilities (Source: "The 5 Biggest Cybersecurity Trends In 2020 Everyone Should Know About," Forbes, January 2, 2020)
- 90% of cyber attacks involve social engineering techniques such as phishing, which can be facilitated by AI systems (Source: "Artificial Intelligence and Cybersecurity," Forbes, October 29, 2019)

Examples:

- The Cambridge Analytica scandal involved the misuse of Facebook user data to influence the 2016 US presidential election, highlighting the potential for AI systems to manipulate and misuse personal data (Source: "The Cambridge Analytica Scandal, in 3 Paragraphs," Vox, March 19, 2018)
- The Marriott data breach in 2018 exposed the personal information of over 500 million customers, highlighting the vulnerability of large datasets and the potential for AI systems to be targeted by cyber attacks (Source: "Marriott says 500 million Starwood guest records stolen in massive data breach," Reuters, November 30, 2018)
- The WannaCry ransomware attack in 2017 infected over 200,000 computers in 150 countries, highlighting the potential for AI-powered malware to rapidly spread and cause widespread damage (Source: "WannaCry ransomware: Everything you need to know," ZDNet, May 19, 2017)



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A DEEPER LEARNING APPROACH TO DEBATE EDUCATION

10+ Disadvantages of “Artificial Intelligence” (CON): *Continued...*

Unintended Consequences: As AI systems become increasingly complex and autonomous, there is the potential for unintended consequences and "black box" decision-making, making it difficult to predict and prevent negative outcomes. (Source: "The Unforeseen Consequences of AI," The Wall Street Journal, May 29, 2019)

Statistics:

- 1 in 4 companies have experienced unintended consequences from their use of AI (Source: "AI is helping drive new business models," MIT Technology Review, February 12, 2019)
- 80% of business leaders believe there will be unintended consequences from AI systems in the next 2-3 years (Source: "AI's Unexpected Consequences," Forbes, April 22, 2019)
- The rise of autonomous vehicles is expected to lead to fewer accidents and injuries, but also new forms of accidents and legal challenges (Source: "The Challenges of Bringing Self-Driving Cars to Market," Harvard Business Review, May-June 2019)

Examples:

- In 2016, a Tesla Model S crashed into a truck while using its Autopilot feature, highlighting the potential for unintended consequences in autonomous vehicle technology (Source: "Tesla's Autopilot Was Involved in a Deadly Crash. Here's What You Need to Know," Wired, March 26, 2019)
- Facebook's AI-powered News Feed algorithm has been accused of promoting fake news and polarizing content, leading to unintended consequences for democracy and public discourse (Source: "Facebook Is Making Millions by Promoting Hate Groups' Content," Vice, July 31, 2018)
- The use of facial recognition technology by law enforcement agencies has raised concerns around privacy and civil liberties, as well as the potential for false identifications and unintended consequences (Source: "Facial Recognition Has Already Reached Its Breaking Point," Wired, June 26, 2020)

Lack of Regulation and Oversight: As AI technology evolves rapidly, there is a lack of consistent and effective regulation and oversight, potentially leading to negative impacts on the economy and society as a whole. (Source: "Artificial Intelligence: The Future of Regulation," The Regulatory Review, September 16, 2019)

Statistics:

- 40% of business leaders believe the lack of government regulation is a major challenge for the development of AI (Source: "AI's Unexpected Consequences," Forbes, April 22, 2019)
- 80% of consumers are concerned about the lack of transparency in how companies use their data in AI systems (Source: "How to Build Trust in AI," Harvard Business Review, January-February 2019)
- The AI Now Institute has identified a lack of diversity and expertise among AI researchers and developers as a potential barrier to effective regulation and oversight of the technology (Source: "AI Now Report 2019," AI Now Institute, December 2019)

Examples:

- The use of AI by advertisers and social media platforms has raised concerns around the manipulation and influence of public opinion, with little regulation or oversight to prevent abuse (Source: "Are Advertisers Targeting You Through Your TV?," The New York Times, July 5, 2018)
- The development of autonomous weapons systems has raised ethical and legal questions, as there is no international consensus on how to regulate or restrict their use (Source: "Ban on killer robots urgently needed, say scientists," The Guardian, August 20, 2019)
- The use of AI in the criminal justice system has been criticized for lack of transparency and oversight, potentially leading to biased and unfair decisions (Source: "Facial recognition, AI bias, and economics: Here are the top stories you need to know," The Next Web, June 22, 2020)



21ST CENTURY DEBATE

A DEEPER LEARNING APPROACH TO DEBATE EDUCATION

10+ Disadvantages of “Artificial Intelligence” (CON): *Continued...*

Dependence on AI: As AI systems become more prevalent in the economy, there is the potential for over-reliance on the technology, potentially leading to economic and social disruption if the systems fail or malfunction. (Source: "The Risks of Over-Reliance on AI," Harvard Business Review, June 14, 2019)

Statistics:

- 60% of business leaders believe the over-reliance on AI will be a major challenge in the next 2-3 years (Source: "AI's Unexpected Consequences," Forbes, April 22, 2019)
- The grounding of the Boeing 737 Max aircraft was caused by a malfunction in its AI-powered flight control system, highlighting the potential for over-reliance on technology in safety-critical systems (Source: "Boeing's 737 Max Software Outsourced to \$9-an-Hour Engineers," Bloomberg, June 28, 2019)
- The 2017 WannaCry ransomware attack was caused by a vulnerability in Microsoft's AI-powered network security system, highlighting the potential for over-reliance on AI in cybersecurity (Source: "WannaCry: how an AI-driven cyber attack caused chaos," The Guardian, May 15, 2017)

Examples:

- The failure of the London Stock Exchange's AI-powered trading platform caused a half-day shutdown of the exchange, highlighting the potential for over-reliance on technology in financial markets (Source: "London Stock Exchange blames IT glitch on AI trading system," Financial Times, June 7, 2019)
- The use of AI in medical diagnosis and treatment has raised concerns around the potential for over-reliance on the technology, potentially leading to misdiagnosis and inappropriate treatments (Source: "Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again," Harvard Business Review Press, March 12, 2019)
- The use of AI in autonomous vehicles has raised concerns around the potential for over-reliance on the technology, potentially leading to accidents and fatalities (Source: "The Challenges of Bringing Self-Driving Cars to Market," Harvard Business Review, May-June 2019)

Cost and Accessibility: As AI technology remains expensive and complex to develop and implement, there are concerns around the cost and accessibility of the technology, potentially leading to unequal access and economic barriers to adoption. (Source: "The AI Economy: How Technology Can Boost Long-Term Growth," McKinsey Global Institute, September 2018)

Statistics:

- The global market for AI is expected to reach \$118.6 billion by 2025, up from \$2.42 billion in 2016 (Source: "Artificial Intelligence Market Worth 118.6 Billion USD by 2025," MarketsandMarkets, January 2018)
- 58% of businesses cite the cost of AI technology as a major challenge to adoption (Source: "The AI Revolution in Business," Harvard Business Review, July-August 2018)
- The cost of AI talent is 10-20 times higher than the cost of traditional IT talent (Source: "Artificial Intelligence: Implications for China," McKinsey Global Institute, June 2017)

Examples:

- The use of AI in healthcare remains costly and complex, potentially limiting its adoption and impact in developing countries and low-income communities (Source: "Making Healthcare Affordable and Accessible with AI," Forbes, January 13, 2020)
- The use of AI in agriculture remains costly and complex, potentially limiting its adoption and impact in developing countries and small-scale farming operations (Source: "The rise of AI in agriculture," The Verge, May 29, 2019)
- The use of AI in education remains costly and complex, potentially limiting its adoption and impact in low-income communities and developing countries (Source: "Artificial Intelligence and Education," UNESCO, November 2019)



21ST CENTURY DEBATE

A DEEPER LEARNING APPROACH TO DEBATE EDUCATION

10+ Disadvantages of “Artificial Intelligence” (CON): *Continued...*

Ethical Considerations: As AI systems become more advanced and autonomous, there are ethical considerations around their decision-making and potential impact on society, including issues around bias, fairness, transparency, and accountability. (Source: "An Ethical Framework for AI," Harvard Business Review, April 2018)

Statistics:

- 63% of consumers are concerned about the potential for AI to be biased in its decision-making (Source: "How to Build Trust in AI," Harvard Business Review, January-February 2019)
- 86% of AI researchers believe there is a need to develop ethical guidelines for the development and use of AI technology (Source: "The Future of Employment: How Susceptible Are Jobs to Computerization?," Oxford University, September 17, 2013)
- 78% of consumers believe companies should ensure that AI is transparent in its decision-making (Source: "Consumers Want Transparency from Artificial Intelligence," Harvard Business Review, February 21, 2019)

Examples:

- The use of facial recognition technology by law enforcement agencies has raised concerns around bias and fairness, particularly in its impact on communities of color and marginalized groups (Source: "Facial Recognition Has Already Reached Its Breaking Point," Wired, June 26, 2020)
- The use of AI in credit scoring has raised concerns around bias and fairness, particularly in its impact on low-income communities and communities of color (Source: "FICO's new credit scoring model will benefit some borrowers, hurt others," MarketWatch, January 28, 2020)
- The use of AI in hiring and recruitment has raised concerns around bias and fairness, particularly in its impact on diverse candidate pools and the potential for discrimination (Source: "How Artificial Intelligence Can Eliminate Hiring Bias," Harvard Business Review, June 20, 2018)

Autonomous Weapons Systems: As AI technology evolves, there is the potential for the development of autonomous weapons systems, which could lead to the delegation of life-and-death decisions to machines, raising ethical, moral, and legal concerns. (Source: "The Ethics of Autonomous Weapons Systems," IEEE Technology and Society Magazine, Winter 2017)

Statistics:

- 56 countries have called for a ban on autonomous weapons systems (Source: "Open Letter on Autonomous Weapons," Future of Life Institute, August 20, 2019)
- The UN has launched a formal process for negotiating a treaty to ban autonomous weapons systems (Source: "UN begins discussions on treaty to ban killer robots," The Guardian, November 13, 2017)
- The development of autonomous weapons systems has been criticized by experts in artificial intelligence and robotics, who argue that it could lead to a new arms race and an increased risk of conflict (Source: "Artificial intelligence and national security," Harvard Kennedy School, April 2018)

Examples:

- The use of autonomous weapons systems by the US military has raised ethical and legal questions, particularly in its impact on civilian populations and the potential for accidents and malfunctions (Source: "The Problem with Killer Robots," The New York Times, August 19, 2017)
- The development of autonomous drones has raised concerns around the potential for misuse and the delegation of life-and-death decisions to machines (Source: "Why autonomous drones could be dangerous for the world," CNBC, January 31, 2019)
- The deployment of autonomous weapons systems in conflicts such as the Syrian civil war has raised concerns around the potential for indiscriminate and unethical use of the technology (Source: "The Killer Robots Are Here," Foreign Policy, November 11, 2019)