Background literature review

**Students’ voices on Generative AI**

Found that there is a generally positive attitude towards generative AI in teaching and learning.

**Students’ Perceptions of the Use of AI in a Writing Class** Also backs up the claim of students having a generally positive perception towards AI

According to John Biggs’ 3P model, student perceptions of their learning environment, abilities and teaching strategies, with positive perceptions leading to deep learning and negative perceptions leading to surface level learning. Students perceive generative AI technologies as beneficial for providing personalized learning support that is available 24/7. There is a positive correlation between students’ knowledge of generative AI technologies and frequency of use, which suggests that exposure to this technology may help in students’ acceptance of this technology which could further enhance learning. While students perceptions of AI are generally positive there is some concerns over the accuracy and transparency of the tools. Students were concerned about the validity of the outputs of the AI as well as some concerns that they cannot trust the output as some AI’s are like a black box where you provide a prompt and it spits out some text which may or may not be correct and you don’t know how it arrived at that solution

* Educational institutions should consider providing educational resources, perhaps workshops may be a sensible idea, to let students familiarize themselves with AI tools.
* The developers behind these AI tools could provide more transparency in how the tools arrive at their outputs e.g. Bing AI provides links to where it got its output from or simply providing an explanation of the AI’s decision making process.

**Teaching for Quality Learning at University**

**John Bigg (2nd edn. 2003)**

**Chapter 2, pp. 11-25**

This is where the 3P model and idea of surface and deep learning are presented. A surface approach to learning is when a student has the intention to simply get the task out of the way with minimum effort in order to meet the course requirements, using a low level of the students’ cognitive abilities to get the work done or to make it appear that the work has been done. A deep approach to learning arises from when a student feels a need to engage with tasks appropriately to understand the underlying meaning behind the tasks, using a high level of cognitive ability to get the job done fully and properly. The 3P’s model describes three points which are important for learning: presage, before learning takes place (includes students’ prior knowledge and motivation); process, during learning (where student will engage in either surface or deep learning activities) and product, the outcomes of learning (where students will have either quantitative or qualitative knowledge and understanding of the subject matter). The model highlights the importance and impact that a students’ prior perceptions can have on their learning with positive perceptions leading to deep learning and negative perceptions leading to surface learning.

**From Ban it till we understand it to resistance is futile**

Some good explanations of the capabilities and limitations of AI tools.

A snapshot in time of university programming instructors’ thoughts on generative AI like ChatGPT. in early 2023. Found that in the short-term instructors were concerned about cheating which led to immediate reactions such as banning AI tools and weighing exams more (where AI tools aren’t allowed). Instructors’ long-term plans diverged into two groups, one group who wanted to resist the use of AI tools by creating AI-proof assignments, paper-based exams and focusing on teaching the fundamentals(analogy of math educators teaching the fundamentals of arithmetic and algebra after the invention of the calculator), and another group who wanted to embrace AI tools by integrating their use into classes:

A diagram of a diagram

Description automatically generated with medium confidence

**Education in the Era of Generative Artificial Intelligence**

Basically just an exploratory study into what ChatGPT is. Some discussion on the benefits of generative AI in terms of teaching and learning including: Personalized tutoring, automated essay grading, language translation, interactive and adaptive learning. Also discussion of the downsides of using generative AI for teaching and learning including: Lack of human interaction, limited understanding, bias in training data, lack of creativity, dependency on data, lack of contextual understanding and privacy concerns.

**Would GPT-3 Get a Wharton MBA?**

Most important part of this is the benefits to teaching: “It normally takes me about 20 hours of work to create an exam and another 10 hours for TA’s to test the exam and write solutions to it. Now, I think we could get my exam writing time down to 10 hours and the TA time down to 5. In other words, we have a 100% productivity increase in the “exam writing operation”. It is easy to imagine similar magnitudes of improvement in grading processes, tutoring, and office hours.”

Another benefit for teacher is in this study:

“the majority of the automatically generated content is both novel and sensible.” They go on to say “Our analysis suggests that there is significant value in massive generative machine learning models as a tool for instructors, although there remains a need for some oversight to ensure the quality of the generated content before it is delivered to students” indicating that there is potential for teachers and instructors to save a lot of time through the use of generative AI which would allow them to have more contact time with students, which will in turn increase the quality of students’ learning: **Increasing instruction time in school does increase learning**

**Studying the effect of AI Code Generators on Supporting Novice Learners in Programming**

“results indicate that AI Coding assistants can be an asset for computer science educators and students alike: AI code generators allowed novice programmers to perform better and faster with less frustration when writing code and did not reduce their performance on manual code modification or in the subsequent absence of AI code generators.”

**Academic Integrity considerations of AI Large Language Models in the Academic Integrity considerations of AI Large Language Models in the post-pandemic era: ChatGPT and beyond post-pandemic era: ChatGPT and beyond**

The responses outputted by Large Language Model’s such as ChatGPT is original and coherent enough to pass plagiarism detectors and is often indistinguishable from a real students work to academic staff. This raises a significant threat to academic integrity of educational institutions around the world as students can submit the response of a generative AI tool as their own work and it is unlikely to be discovered that is was written by AI.

**ACM code of ethics 1.5**

possible issue with ethics and licensing as chat gpt is trained on publicly available code repositries like github, some code suggestions may use code it learned here which could be under some license which prohibits its use in the way the person accessing the chat bot is going to use it, ACM code of ethics. It currently does not acknowledge if It got code snippets from or if it generated them itself.