

Poetry, Creativity, and ChatGPT

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When working with young engineering students at the junior level one must realize that they are focused completely on the task at hand, placing themselves in a career that makes them chemical, mechanical, electrical, or one of the various other forms of being an engineer. They have usually spent the first two years of college rushing through all the humanities, social studies, and composition classes that they can to remove those from their radar. Now they have arrived at the time when many colleges accept them into the brother/sister hood of the profession. They come with a wide perspective on engineering, a number of mathematics courses, and in many cases nothing more. They seem to understand all that engineering holds but fail to understand what is important in their lives as engineers. In many cases they fell into a trap as freshmen when some evil force behind the curtain told them that they were not creative and creativity was a strange item practiced by those characters in departments like Theatre and English. Over the years all incoming junior mechanical engineers at Michigan State University have been writing poetry, not to punish them or to drive them to the dark side, but to allow them to widen their perspective on the world in which engineers inhabit with other people who are just as creative as they.

Yes, all people have an enormous amount of creativity. It simply takes a gentle push or sometimes a swift kick to open their minds to their creative selves. Writing poetry can be a fascinating and creative endeavor that allows them to explore a different side of their thinking. Poetry is a medium that encourages the expression of emotions, ideas, and experiences in a concise and artistic manner. Over the many years, thousands of poems have been created by engineers in the junior mechanical engineering class at Michigan State University. They all write under the umbrella that all work is creative. There are no judgment calls that this poem or that poem is better than any other. They are presented as creative works and allowed to be viewed as liked by some and not so liked by others. No writer is left aside. All are writers and all are creative. They find that there is an investigative nature of poetry. Poetry often involves wordplay, metaphors, and symbolism. They can investigate metaphorical language or unique ways to describe technical concepts. This can add depth and layers to their poems that they may not have tried before.

This year as a work in progress we decided to try a new path for the students to follow. They began with the instruction to NOT use ChatGPT or any other AI to write their poems. They had to create what they could and hand it in. The next step was to take that work and put it in ChatGPT and create three more versions of their original work. In this paper we explore the use of ChatGPT to not create required work but to show that as a tool ChatGPT opens up the doors of new forms of creativity, student evaluation of their own work in comparison to the added tool of ChatGPT, and the avenues that a student can follow to create more in-depth work. We will reflect on the students' comments about the writing of poetry, the evaluation process of their work as helped by ChatGPT, and the sense of accomplishment in what they have created.

The true use of ChatGPT as a tool starts with ChatGPT being asked a simple question, "What good is incorporating the teaching of poetry in engineering courses." The answer came quickly with the following. ChatGPT is a tool and should be used as a tool.

” These learning objectives can be adapted and tailored to suit the specific goals, interests, and level of expertise of the students, as well as the broader objectives of the engineering course in which poetry writing is being integrated.

1. **Enhancing Creativity:** Encourage students to think creatively by expressing engineering concepts, principles, or experiences through poetic language and imagery.
2. **Exploring Metaphorical Thinking:** Introduce students to the use of metaphor, simile, and other figurative language techniques to convey complex engineering ideas in a vivid and imaginative manner.
3. **Developing Communication Skills:** Improve students' ability to communicate technical information effectively by practicing concise and expressive language, which can be valuable in writing reports, proposals, and presentations.
4. **Encouraging Reflective Practice:** Promote self-reflection and deeper understanding of engineering concepts by encouraging students to explore personal insights, emotions, and experiences through poetry writing.
5. **Fostering Interdisciplinary Connections:** Explore the intersection of engineering and other disciplines, such as literature and art, to foster interdisciplinary thinking and broaden students' perspectives on their field of study.
6. **Stimulating Critical Thinking:** Challenge students to analyze and interpret poetry written by others, including poems related to engineering themes, to develop critical thinking skills and appreciate diverse perspectives.
7. **Promoting Empathy and Ethical Awareness:** Encourage students to consider the societal, environmental, and ethical implications of engineering projects through poetry that explores human experiences, values, and emotions.
8. **Building Confidence and Resilience:** Provide a supportive environment for students to experiment with creative expression, take risks, and overcome challenges, thereby building confidence and resilience in their academic and professional endeavors.
9. **Cultivating Aesthetic Sensibility:** Cultivate an appreciation for the aesthetic aspects of engineering design and innovation by exploring the beauty and elegance inherent in both poetry and technological solutions.
10. **Facilitating Collaborative Learning:** Promote collaboration and peer feedback by engaging students in group discussions, workshops, and constructive critique sessions to refine their poetry writing skills and provide mutual support.”

We can use these ChatGPT generated ideas to start the conversation. This is where we will begin to spend the next few semesters investigated the creative process involved with using ChatGPT to encourage our students to work with poetry and its creation within engineering.

While Mechanical Engineering 300 is the focus of these comments, I would mention that the use of poetry in the College of Engineering at Michigan State University has been in use over many years. As was commented in a paper a number of years ago, a poetry forum was created to allow individuals the freedom to simply create, “In the beginning, we expected students to rebel against the writing of poetry, but we did not expect the production that we actually received. With no pressure to produce, students were stepping forward and creating pages and pages of very well-expressed text.” The forum allowed everyone and anyone to produce whatever they wanted to in the area of poetry. It also helped to make poetry something that was not completely foreign to the engineering world. The anecdotal remarks produced by the students, faculty, and staff opened up

a fair amount of discussion on poetry and the interest there is in its creation.

With the above in mind, it was an easy step into asking students to write poetry in any course that the author taught. Again there was no pressure to produce only certain types of poetry or evaluate the production made on any competitive basis. Letting individuals experiment and make an effort at creating their work was all that was intended. The comment that is always made when the students produce their work is, “You have written a work of poetry – therefore you are poets!” Much the same as, when asked to draw a picture of any sort, “You are an artist!” This may not fit with another person’s definition of poet and artist, but it does accomplish bringing a great number of engineers into the creative fold.

The conversations that can be created inside and outside class about the investigation of the exact words one wants to use, the emphasis upon manipulating the lines, and using one’s emotions to get the message across are a suitable way to get engineers involved in their writing. Poetry, because of its useful length, allows the engineer to produce the effort, but more than likely spend less time in getting those ideas onto the page. In an article in NES FIRCROFT September 9, 2021 “An Engineer’s Mindset: Creativity in Engineering” the comments on creativity are clear. “With a growing population coupled with climate concerns, it’s more important than ever that engineers are being provided with the resources and opportunities that produce creative and innovative solutions to the problems we face. Perhaps this is why we’re seeing an increase in the number of educational institutions that offer design alongside engineering.”

This year it was decided that the students in ME 300 would venture into a different area of poetry writing. Yes, they would produce poetry in any form or shape. Their topics could be as far ranging as they desired. And in some cases, they could collaborate with friends to put together their text. It was interesting that a few chose to work with others to accomplish the assignment. And even though it was considered an assignment, it was never to be graded. Putting something between a 0.0 and a 4.0 defeated the purpose of the act of creation. One student commented that Van Gogh probably would have gotten a 0.0 if he had been graded when he was alive. Grades can be fine, but in some cases, they defeat the purpose that we have in mind to allow the creative juices to flow.

The students were given their task along with as much guidance in the variety of forms of poetry in which they could experiment. Any assistance needed on finding their personal path was provided. In many cases, the path led to the Haiku simply because of its very short nature (5-7-5 syllables) and its usual focus on nature. It was popular with the engineers. Interestingly, they didn’t stop in creating the one piece that was assigned. They kept going and produced a number of works to hand in. I really feel that they got involved in the added production, not simply thinking that they had to produce more lines to get the grade. But that was not the case because there was no grade involved. The only instruction that they received other than any form is acceptable and any topic is acceptable was that they could not use AI. We had started talking about AI and the storm clouds were already brewing on the horizon of academia. AI was being condemned by many as the newest evil force in the universe. AI would produce a new generation of cheaters who would never think a thought of their own. We talked about this in class and investigated stories of witch burnings, the condemnation of books, and the voices that wanted all motor cars destroyed on sight. It was an easy movement to talk about how generations upon generations have condemned the latest tools to the human world. AI is a tool and if used

productively can provide a wealth of knowledge and creativity to the creator and to those who view the creation.

The students produced their work, handed it in, and were given Part 2 of the assignment, that being – take what you have written and go to ChatGPT and let ChatGPT look at what you had written and provide new ideas, words, and paths for the ideas. Remembering that this is an individually creative endeavor that was a personal adventure, the students were asked to evaluate what ChatGPT provided them in its comments on and additions to their work. Here is where they began to realize that ChatGPT was allowing them to evaluate what it gave them and they in turn could evaluate what they were given. ChatGPT was a tool. It was not the end all. The students would be the end all when they took a look at the comments that they were provided and decide whether or not they would use the added comments, reassess their work, or make subtle changes to the poetry that they created. Whatever they would do would end up as their creative effort.

In that way we must now use ChatGPT, again as a tool for information, as itself to offer its comments to the value it serves our engineers:

“Engineers can use ChatGPT to spark their creative process. They can input engineering-related topics, concepts, or challenges into the model and ask for poetic interpretations. This can lead to fresh and innovative perspectives on their work, inspiring new ideas for poems.

1. Wordplay and Metaphors
2. Collaborative Writing: Collaborating with ChatGPT can be a fun way to co-create poems. Engineers can write a line or stanza, and then ask ChatGPT for suggestions to complete the next part. This collaborative approach can lead to unexpected and intriguing results.
3. Diversifying Themes: Engineers may have a tendency to focus on technical themes in their writing. ChatGPT can help them explore a wider range of topics, emotions, and experiences for their poetry. They can ask the model for ideas on different themes and how to connect them with their engineering background.
4. Feedback and Refinement: Engineers can use ChatGPT to get feedback on their poetry. They can share their work with the model and ask for suggestions on improving the structure, rhythm, or wording. This iterative process can lead to more polished and impactful poems.
5. Exploring Multiple Styles: ChatGPT can introduce engineers to different poetic styles and forms, such as haikus, sonnets, or free verse. They can experiment with these styles to find the one that resonates with them and their message.
6. Embracing Emotion: Engineers often deal with logic and facts, but poetry allows them to express emotions and personal experiences. They can use ChatGPT to help them find the right words to convey their feelings in a poignant and relatable manner.
7. Personal Growth: Engaging in creative writing like poetry can promote personal growth by encouraging engineers to explore their thoughts and feelings. ChatGPT can serve as a companion in this creative journey, providing guidance and support.”

Ultimately, engineers can harness the power of AI like ChatGPT to broaden their horizons and enrich their poetry-writing experience. By blending their technical knowledge with the creative potential of AI, engineers can produce poetry that is unique, thought-provoking, and deeply personal.”

Because this is a work in progress, a work that has only involved one semester of effort on the part of the students, and a work that may take on various paths to conclusion, I would end with comments from the students themselves and example of what they did with their own work and how ChatGPT provided them with a tool to more carefully investigate their efforts and bolster their creativity.

Incorporating the teaching of poetry writing into an engineering course can offer students a unique opportunity to develop creative thinking skills, explore interdisciplinary connections, and enhance communication abilities.

Linking creativity to practical engineering involves recognizing that creativity is not just about artistic expression but also about problem-solving, innovation, and design in the engineering context. “Here are several ways to establish this link taken from ChatGPT:

1. **Problem Identification and Definition:** Creative engineers are adept at identifying and defining problems in innovative ways. They may approach a problem from multiple perspectives, considering not only technical constraints but also social, economic, and environmental factors.
2. **Brainstorming and Idea Generation:** Creativity in engineering often involves brainstorming sessions to generate a wide range of ideas for potential solutions. Engineers can use techniques like mind mapping, analogical reasoning, and lateral thinking to explore unconventional approaches.
3. **Conceptual Design and Prototyping:** Engineers employ creativity in the conceptual design phase, where they translate ideas into tangible concepts. Rapid prototyping and iterative design processes allow for experimentation and refinement of innovative solutions.
4. **Cross-disciplinary Collaboration:** Creativity flourishes when engineers collaborate across disciplines, such as working with designers, scientists, and stakeholders. Interdisciplinary teams bring diverse perspectives and expertise to the problem-solving process, leading to more creative solutions.
5. **Use of Analogies and Metaphors:** Engineers often use analogies and metaphors to explain complex concepts and to inspire new ideas. Drawing parallels between unrelated fields or phenomena can spark innovative approaches to engineering challenges.
6. **Embracing Failure and Iteration:** Creative engineering involves a willingness to take risks, learn from failure, and iterate on designs. Engineers view setbacks as learning opportunities and use feedback to refine and improve their solutions.
7. **Ethical and Sustainable Innovation:** Creativity in engineering extends beyond technical feasibility to consider ethical and sustainability considerations. Engineers strive to develop solutions that are not only innovative but also socially responsible and environmentally sustainable.
8. **User-Centered Design:** Creative engineers prioritize the needs and experiences of end-users when designing solutions. User-centered design methodologies, such as empathy mapping and persona development, ensure that engineering solutions address real-world problems effectively.
9. **Continuous Learning and Adaptation:** Creative engineers embrace lifelong learning and stay abreast of emerging technologies, trends, and best practices. They adapt to

evolving challenges and opportunities by continuously expanding their knowledge and skillset.

10. **Communication and Visualization:** Creativity is integral to effective communication in engineering. Engineers use visualizations, diagrams, and storytelling techniques to convey complex ideas and engage stakeholders in the design process.”

By integrating creativity into practical engineering processes, engineers can develop innovative solutions that address complex challenges and contribute to positive societal impact.

Students’ comments from those who really wanted to write poetry and those who were basically averse to the effort.

“ When I used ChapGPT I tried not to think that I was cheating by taking ideas from a source and claiming them to be mine. But when I looked what was given me, I realized that I like my ideas better and thought about what was in front of me and made my own changes to fit my desires. It really was MINE in the end!”

“All ChatGPT did was make me think. I knew that I had created what was in front of me and I just evaluated what ChatGPT suggested and thought about it as a suggestion, nothing more. I remembered my dad telling me to be careful on my bike, then I rode like the devil. I did listen, but I did it my way.”

“ChatGPT made it easy for me to get involved in something that I didn’t have an interest in. I wrote some lines, then ran it through chat. I was amazed at what it did with what I wrote. Some of it I liked and some I didn’t but it was great to have actual comments for me to think about.”

The students started with their own original works and then experimented with ChatGPT. Here is one who took their work, used ChatGPT and then evaluated the experience.

Original Poem:

Marching on as one,
Whites united. loyal fans,
Leeds pride shines bright.

ChatGPT 1:

Whites march in Leeds’ pride,
Elland Road echoes their stride,
United spirits guide.

ChatGPT 2:

Whites march with fervor,
Elland Road’s heartbeat echoes,
Leeds United strides.

ChatGPT 3:

Elland Road echoes,
Leeds United, hearts marching,
Whites stride in glory.

“I think because I used a Haiku and limited ChatGPT to that as well there was not a whole lot of variation besides how verbs are used. I think if I would have given ChatGPT free reign it could have given me ideas to make a longer poem. I like these poems as it seems like they have a better flow than mine as well as including Elland Road, the soccer team’s stadium, which opened a new section of ideas to use. I would have used these poems to help as it opens up to more ideas that can be branched off in order to make it something of your own with the help of ChatGPT as that is what its current design is to do.”

And finally, the raw comments that came from students judging their efforts and the worth of ChatGPT as distinctly a tool to provide them with assistance in Taking ChatGPT As that tool to refine their own work.

“ChatGPT and my Poem

When taking my poem and putting it into ChatGPT twice, I got back an interesting poem that didn’t seem to make much sense. I think that there are certain elements with ChatGPT generated poems that could be added on to my poem for improvement, but overall, I thought that my poem was better than ChatGPT’s iterations and made more sense. I think ChatGPT is a valuable tool when used the right way, but can also be unbeneficial when not used in the correct way.”

“The poems are worse. But they are interesting in how they are written. The lines are disconnected, but it covers different topics, topics I wouldn’t normally consider, when ChatGPT goes through the poems. I think that would help in the brainstorming phase, where metaphors and ideas are written to get an idea of how to form the ideas with feelings into the poem, but I think ChatGPT suffers the same issues that middle/early high schools students struggle with (and some beyond). In time, however, I think that ChatGPT will be a better writer than now.”

We have just started to delve into the uses that we can make of ChatGPT and its value in the creation process. It will be important to guide students through this creation process and show them the paths that lead to much more in-depth evaluation of what ChatGPT offers and how their original work can improve.

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