

DEVELOP! DRAW! BUILD! WIRE: TEACHING ROMANTICISM TO ENGINEERING STUDENTS USING HYBRID PEDAGOGY

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Abstract. *As the 21st century has been marked as the age of 4Cs, the necessity of educating creative engineers has become a challenge for all educators, especially those teaching Humanities. Using Hybrid Pedagogy as a methodological approach to teaching, which strives to establish interconnectedness of learning, teaching, and technology in our lives, engineering students at the University of Kragujevac were engaged in the international celebration project Frankenreads. These students successfully materialized a series of 'engineering' project outcomes; they created a website, a video, a 3D visualization, an exhibition of book cover designs, a moving robot, and a dramatic enactment. The project assignments served as a bridge to students' future professions in an event agenda that could have easily been a real employment project. The paper finally explores how the implementation of authentic humanities-oriented projects creates more meaningful and impactful engineering educational contexts.*

Key words: *Frankenstein, Hybrid Pedagogy, Engineering, Humanities, Higher education, Romanticism*

1. INTRODUCTION

Whatever the literary category it belongs to, Mary Shelley's *Frankenstein; or, the Modern Prometheus* (1818) remains, arguably, one of the most influential novels in the world. The inventory of genres that could, conventionally, be pulled to define it, range from (the first) science-fiction novel to a Gothic (horror) story, only to let it be further thematically dissected as an epistolary narrative with elements of alchemy, a psycho-thriller, a literary utopia, an archetypal (anti)heroic mythic narrative, a teenage novel of identity, a tragic odyssey of the mankind, even a feminist novel (Mellor 1988), etc. To elope any rigid reductionist categorization and leave many insightful scholarly readings of the book aside, here I will rely solely on the pleasure a reader finds in the text whatever literary form it takes, and stick to what common knowledge of the book is - *Frankenstein* is a classic of English literature whose timeless cultural legacy goes far beyond the English-speaking countries. As such, no other Belles-lettres novel has had its iconic storyline so ruthlessly exploited in pop culture that it has been established as a pan-social authority and a phenomenon of its own. Finally, the prefix Franken- has

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become a meaning bearer of many terms across many disciplines, and has been constantly reappearing as a pejorative term, a synonym for something scary, corrupted, or modified. From the ecocritical perspective, the underlying motif of scientists playing God and the concept of humanity's misappropriation of power have raised many concerns about how we deploy biotechnologies. In the age of advent of the Artificial Intelligence, Metaverse and human engineering, this issue has become even more actual. For all those reasons, Shelly's novel emerges as an invaluable resource for teaching, especially to engineering students. It is a fantastic playground for raising intercultural awareness with an enormous potential for building various multidisciplinary projects that can add transformative value to participants' experiences.

A hybrid character of the novel, genre-wise, might initiate an interesting discussion on how hybrid our knowledge of Frankenstein is, giving us, educators, more capacity to decide which teaching approach to use when teaching it. For many, Frankenstein is a monster itself, not its creator. Indeed, building upon numerous film adaptations that have established a common visual identity of Frankenstein, many young people nowadays associate the monster with a green ogre with bolts in its neck. Similarly, the question of authorship is usually erroneously attributed to P. B. Shelly who is considered a more prominent literary figure than his wife. In other words, the question that arises here is: to what extent have we unintentionally 'inserted' our own interpretations into the character for the past 200 years by assigning meaning or a trait the character does not have, or by adopting certain Franken-related clichés without prior consulting relevant resources? These misconceptions become ingrained and widely accepted, perpetuating a hybrid understanding of the character. Over the years, such unintentional mish-mash hybridity in our connaissance of the novel has been cultivated for years in media and elsewhere further solidifying the misconceptions and distorting our understanding of the original intent and essence of the novel. For dispersing these and other common misconceptions about the novel, it would be interesting to explore whether 'cultural syncretism' in our learning about Romanticism is oversimplifying and devaluing the novel (especially with students who do not study Humanities), as we also might wish to investigate why has the consumerist culture privileged a 'hybrid' Frankenstein model, thus disregarding many artistic merits of the book?

I hypothesised that students who pursue STEM degrees and are considered Digital natives belong to the group whose knowledge of Frankenstein is indeed hybrid. That is why I conducted a project with the aim to teach foundations necessary for understanding Frankenstein's relevance and implications for science and technology today. For this particular project, the hybrid pedagogy approach emerged as the most suitable, hands-on teaching concept.

2. HYBRID PEDAGOGY OR FRANKENSTEINISATION OF EDUCATION

The hybrid learning model is not a new concept in education (Köppe and Midelkoop 2020) and should not be confused with blended learning as they contain the same instructional elements. Hybrid learning refers to learning that happens both in a classroom and online (Stommel 2012), includes synchronous and asynchronous communication, and can be defined as "an intermediate step between fully F2F and fully online learning environment" (O'Byrne and Pytash 2015, p.138). However, Hybrid

Pedagogy differs from the hybrid learning model as it emerges more as an overarching paradigm, not just a mere instructional strategy, and refers to “learning that happen[s] in a virtual place into a more engaged and dynamic conversation” (Stommel 2012). What makes Hybrid Pedagogy different is its specific methodological approach, as it is defined by the purpose of the physical place – in other words, Hybrid Pedagogy “merges the dimensions to such an extent that they become part of the same ecological system” (Hilli et al. 2019, p. 69). This concept is based on the premise that delineation between binaries in the learning environment (online/offline mode, teacher/student roles, formal/informal contexts, and analogue/digital communication) are blurred with the purpose “of creating new classroom experiences that cut across countries, courses, roles, contexts, as well as communication and media platforms” (Hilli et al. 2019, p. 66). In Hybrid Pedagogy “people connect and interact through a hybrid network of physical and technology-mediated encounters to co-construct knowledge and effectively engage in positioning practices necessary for their work” (Cook et al. 2016, p. 125). In other words, Hybrid Pedagogy is technologically supported collaborative learning geared toward (or even driven by) active student agency and engaging interactions in educational practices with the goal to accomplish learning outcomes in a more personalized and productive manner. Stommel and Rorabaugh (2012) elaborate:

“As a philosophical concept, hybridity suggests hesitation at a threshold. Hybridity is not an attempt to neatly bridge the gap, but extends the moment of hesitation and thereby confuses easy categorization.”

With an aim to elope the reductive binarity in terms of space/channel of instruction, Hybrid Pedagogy also disrupts the traditional boundaries set around the educators’ participation in the process. Not only does it go beyond the simple integration of online and face-to-face learning, but, as Stommel (2020) posits, Hybrid Pedagogy extends beyond learning itself and encompasses a broader consideration of the multifaceted roles and experiences of educators in academic and non-academic contexts. It emphasizes the need for educators to navigate and cultivate a balanced understanding of hybridity within themselves while guiding students to recognize and navigate the complex interplay of hybridity in their own lives. This approach propels education into the 21st century by fostering critical engagement with tools, experiential learning, and the exploration of collaborative communities, thereby redefining teaching and learning processes (Marquis 2022).

Hybridity at its core emphasizes the exploration of intersections and interconnectedness within education. From a more holistic perspective, it could be described as a momentum, a fluidity, similar to “a fear Mary Shelley explores in *Frankenstein*, wondering about identity and physicality from the first phrase, ‘I am by birth’ ” (Stommel 2018). As Melvin nicely put it “Hybridity implies that a number of pedagogies can be merged in order to work together [...], it is not just a case of mixing traditional approaches with a digital dimension [...].” (2019). It is a bricolage of different perspectives and approaches that are, in essence, related to the creation of communities of inquiry in which educators nurture a sense of belonging, addressing numerous challenges along the way. We, as educators and facilitators, have to design and build these communities with an understanding of these challenges (Stommel 2020).

In practice, Marquis (2022) suggests, Hybrid Pedagogy course discussions are initiated either in a virtual space or in the physical classroom, but they transition to the opposite medium, and go back and forth, when necessary. Secondly, students actively

participate in project-based or problem-based learning, leveraging advanced information and communication technologies to conduct research, synthesize knowledge, and present their findings. Crucially, the class projects involve connections with real-world clients, either within the local community or in virtual settings, and utilize high-tech tools to establish and maintain those relationships. Additionally, the incorporation of real-world experts and examples is facilitated through collaborative technologies, allowing for engaging conversations, exploration of diverse perspectives, and participation in experiences that would otherwise be inaccessible locally. Finally, the outcomes of these course projects are shared with a broader community through in-person interactions and presentations, as well as through virtual channels like Twitter, Facebook, YouTube, etc. From this perspective, Hybrid Pedagogy might introduce novel and exciting outcomes, as its specific approach allows us “to assess how changing time, place, and modes affects instructional objectives” (O’Byrne and Pytash 2015, p. 139).

Unfortunately, research studies on the practical implications of Hybrid Pedagogy have been scarce. Munday (2022) empirically showcased that numerous benefits emerge from the Hybrid Pedagogy approach in higher education settings, listing several factors such as the removal of geographic boundaries, the increased inclusivity afforded by digital teaching and learning; and the increased flexibility of accessing learning materials. The findings of his research suggest that Hybrid Pedagogy in higher education encompasses a pedagogical framework that skilfully blends various discourses, formats, tools, individuals, and contexts. Some benefits of Hybrid Pedagogy as a tool for assessment in higher education have already been explored (Köppe and Midelkoop 2020). However, as current research studies show that “[t]here may be a devaluing of the importance and effect of pedagogy and instructional design in hybrid learning” (O’Byrne and Pytash 2015, p. 139), this paper aims at demonstrating how under the Hybrid Pedagogy approach interesting and valuable projects can be designed.

Metaphorically speaking, the application of the Hybrid Pedagogy approach to this specific project might be referred to as the Frankensteinisation of Education. I would define it as an educational process in which we deliberately replace sections of the syllabus with more hands-on, life-like assignments related to the core course, where the teaching/learning focus gets radically changed; instead of aiming at reaching the initially planned learning goals, the teaching instruction is replaced by a self-directed and self-assessed student engagement in which the goals are defined by students. A productive process of increased student agency is central to it while teacher intervention is minimized. Further on, as outcomes go far beyond the classroom setting and are shared with a wider community, to perform such tasks it is essential that the participants engage, learn, share, commit, delve, produce, re-build, and deliver from a wide range of interdisciplinary angles and perspectives, reaching for many diverse skills and personal experiences, probably more intensively as compared with regular learning conditions. Such educational approach, broadly speaking, is indeed Frankensteinised – uncertain, non-measurable, focused on innovation and collaboration, self-contained, self-influenced, hybrid in its use of online and offline tools and resources, aimed at students’ drawing upon various, often non-related sources, being a bricolage of numerous learning paths and frameworks. In other words, it is a self-driven approach starting from ‘the wondering’ to create ‘the wonderful’, finally to be able to add to the overall value of the participants’ collective experience. A process that disregards the objectives written in a syllabus, geared towards ‘learning bits here and there’ along the way. As such, this

process is as unique in its own terms as Frankenstein itself. However, the problem of evaluating students' efforts and measuring the achieved learning outcomes is the main reason why clear guidelines for using this approach can be found non-applicable to any other similar group. While the actual project deliverables get materialized, what remains hidden is 'how we got there' and to what extent each contributor was engaged in the process. The group dynamics and the personal interactions appear difficult to assess.

When discussing hybridity as a teaching approach, one must not forget that the project we are talking about here was realized prior to the pandemic of COVID-19. Back in 2018, there was no collective uncertainty we all experienced during 2020 and onwards. Our 2018 Hybrid Pedagogy, being offered to students as an optional, non-mandatory framework for this project, allowed us to use the plethora of rich-in-cues activities that prioritized a communicative channel which seemed the most adequate at a certain point. As only a minority of students were firm proponents of exclusively remote instruction at that time, we privileged the circumstances and our personal preferences, and approached the process without the pandemic and post-pandemic pressures we were to encounter years later, without any fear of putting ourselves out there, and with voluntary unlocking more opportunities to collaborate in a vivid tapestry of a dozen of hybrid voices.

Toying with the idea that we could resort to a wide array of possibilities by empowering these young adults to take up learning opportunities, this Hybrid Pedagogy approach enhanced the feeling of togetherness in regard to the means of instruction and the desired outcomes. This feeling may have been poignantly missed during the lockdown, mainly due to the fact that in the next two years, we did not have any similar inspiring project to gather around, but, quite the contrary, we were focused solely on fulfilling the assignments listed in the syllabus. However, what may not come as a surprise, the Frankenstein learning experience had prepared us for the sudden transition to online instruction once the pandemic occurred, so we felt that the hybrid approach was something we had certain knowledge of.

On the other hand, the "Frankensteinisation" of education, while innovative, also presents certain challenges, one notable concern being the inherent complexity and unpredictability of such an approach. By replacing traditional syllabus elements with hands-on, self-directed assignments, educators risk creating a learning environment that is less structured and more difficult to evaluate. This shift from predetermined learning goals to student-defined objectives can lead to ambiguity in measuring educational outcomes and assessing individual contributions. The diverse, interdisciplinary nature of projects may enhance creativity and engagement but can also obscure the clarity and coherence of student achievements, making it challenging for educators to provide consistent feedback and for institutions to uphold academic standards. Moreover, this approach demands a high level of adaptability and self-regulation from students, which may not always align with their capabilities or expectations. Students accustomed to more structured, instructor-led environments might struggle with the autonomy and self-assessment required in such a framework. This can exacerbate inequalities in student performance, as those with stronger self-management skills may excel, while others may flounder. Additionally, the focus on innovative, collaborative projects might divert attention from fundamental knowledge and skills, potentially leading to gaps in core competencies. Consequently, while the Frankensteinisation of education obviously fosters a dynamic and flexible learning environment, it also poses significant challenges in terms of assessment, student preparedness, and the preservation of essential academic rigor.

The concept of "Frankensteinisation" in education can indeed be related to the idea of hybridity, but it is not synonymous with it. Frankensteinisation in education can be seen as a specific, radical instance of hybridity. Hybridity generally refers to the integration of diverse educational modalities, blending online and face-to-face interactions, formal and informal contexts, and various pedagogical approaches to create a dynamic and flexible learning environment (Stommel 2020; Hilli et al. 2019). This approach aims to blur traditional boundaries and adapt to varied learning needs while maintaining a coherent educational framework. In contrast, Frankensteinisation involves a more extreme transformation of curricula, characterized by an eclectic mix of instructional strategies and content driven by student agency and innovation, often deviating significantly from established norms (Marquis 2022). While hybridity seeks to enhance flexibility and adaptability within a structured framework, Frankensteinisation represents a more experimental approach that prioritizes creativity and personalization, potentially at the expense of coherence and clarity. This radical approach can lead to novel educational outcomes but also introduces challenges in terms of assessment and alignment with traditional educational objectives.

3. LITERATURE REVIEW

Unfortunately, there is not much evidence in the relevant literature of similar projects conducted with university students. One of the recent ones, nicely elaborated on by Sarah Maitland (2021), reports on how she taught *Frankenstein* to 2 different groups of students in two universities, although her approach did not include practical, hands-on activities similar to ours. Maitland (2021) argues that much of students' understanding of the *Frankenstein* text comes from their social context. Even after her numerous modifications in the teaching approach and providing more context "the outcome was much the same", as many of her students felt that the central idea of the story was that the violence was all natural and came as a consequence of bullying or hatred. This outcome suggests that Maitland's aim of encouraging a deeper, more critical engagement with the text—one that would challenge students to explore its complex themes beyond simplistic interpretations—was not fully realized, potentially due to the lack of interactive, hands-on elements that might have facilitated a more nuanced understanding.

On the other hand, in primary and secondary contexts, there are several research studies that elaborate on similar projects. For example, Nagy et al. (2020) reported on the project specially designed for *Frankenstein* 200 celebration with the idea to apply the narrative-based approach to teaching so as to enable learners to position themselves as scientists and learn about science and science ethics. The experiment did include the creation of a robot, a toy, mechanical sculptures, electricity experiments, etc, and included 145 observations which provided evidence that the *Frankenstein* narrative helped some participants reflect on the responsibilities of scientists when they design and conduct experiments (Nagy et al. 2020, p. 123). However, the participants were 5- to 12-year-olds, so this study is not relevant to be compared with the one we conducted. Similarly, Mawasi et al. (2021) designed a set of practical, interactive activities (a playdough doll, a moving mechanical device, etc.) to mark the bicentennial of Mary Shelley's novel, and afterwards explored how those assignments helped shape students' perceptions and understanding of science ethics. The findings of the exploratory research indicated that students (aged 14) felt that Science ethics is about being cautious, and about asking for

permission to conduct experiments which should be conducted in such a way that they cause no suffering of any kind. Finally, attempts have been made to introduce hybrid didactic ESP courses, and studies have shown that those were found enriching and can increase students achievements (Montalban 2021).

4. WHAT WE DID—RE-INVENTED BY TECHNOLOGY

Following the kind invitation of The Keats-Shelly Association of America (www.k-saa.org) to partake in the global event of celebrating 200 years of the novel *Frankenstein* with a related program of our own, I decided to design our own 3-day-event entitled ‘200 years of *Frankenstein*: Re-invented by Technology’, at the Faculty of Technical Sciences in Čačak, with the students who attended English courses there. The general event framework consisted of the public reading of the book, which was the only activity the organizers asked for – participants could also organize various kinds of events, lectures, film screenings, and exhibits at high schools, universities, public libraries, and museums. We proudly joined the group of around 200 universities from 30 countries participating in the international event with an original program held in October-November 2018. The content of our event was to be decided upon with my engineering students in one of our English course classes. The main project goal was to involve the engineering students in a set of tasks and activities which might fall within their real professional duties as they demonstrate competences in the fields they actually major in. The idea was to incorporate teaching *Frankenstein* and the Romantic movement foundations under the Hybrid Pedagogy approach, which should help them understand the topic better so that the deliverables would be, hypothetically, worth paying for by any potential employer/customer, and in our case, those that would be perceived as enjoyable and entertaining by any random visitors. In other words, students were to offer innovative solutions within their scope of engineering education and future occupation, but with a twist – a customer (or audience in our case) wants the *Frankenstein* theme.

A cohort of 85 engineering students, hailing from diverse disciplines such as Graphic and Printing Technology, Information Technology, Electrical and Mechanical Engineering, and Production Management, actively participated in the assigned projects. Each group of students, according to their respective majors, was entrusted with specific assignments aligned with their areas of expertise. With a time frame of 8 weeks, encompassing regular teaching hours, we embarked on a comprehensive journey through various project phases: preparation, creative work/design, and culminating in the public display of their accomplished tasks.

In the initial stages, our collective brainstorming sessions resulted in a decision to devise several mini-projects and conduct open-access workshops to facilitate the realization of these endeavours, so that we could finally produce a website, a video, a 3D visualization, an exhibition of book cover designs, a moving robot, and a dramatic enactment of a fictional interview with Mary Shelley. Needless to say, we all agreed that the outcomes were to be presented to a wider audience, through several open-access public events.

For the students specializing in Information Technology (IT), the assignments revolved around the design and creation of diverse multimedia elements. They were tasked with developing captivating videos, engaging websites, and an immersive 3D *Frankenstein*-simulation,

each project aiming to unleash their technical prowess and artistic sensibilities. The Graphic Technology majors embarked on an exciting journey of visual expression, focusing on the design of an exhibition showcasing book covers as well as crafting visually striking logos, posters, and flyers. This engagement allowed them to showcase their graphic design skills while delving into the artistic and aesthetic dimensions of their discipline.

Meanwhile, the students pursuing Mechanical and Electrical Engineering respectively were challenged with the construction of a functional moving robot, combining their engineering skills with creative problem-solving. Additionally, the selected students were tasked with the creation and delivery of a dramatic enactment centred around the intriguing question of authorship within the novel, adding a thought-provoking element to their assignments. Lastly, the Production Management majors embraced a multifaceted role, assuming responsibility for securing project investments, budget management, event promotion, and providing essential technical support. This comprehensive set of tasks allowed them to apply their knowledge and skills in a practical context, honing their organizational and managerial abilities.

Throughout the course of the project, dedicated workshops and guidance were provided to each group, ensuring that they had the necessary resources and expertise at their disposal. The workshops not only nurtured their technical proficiencies but also fostered a collaborative spirit, enabling students to learn from one another and build upon their collective knowledge.

At the culmination of the 8-week timeframe, a public exhibition was organized to showcase the remarkable achievements of the engineering students. The event provided a platform for them to present their work to a wider audience, creating an opportunity for meaningful engagement and feedback. Moreover, the use of various technological tools and platforms allowed for the dissemination of their projects beyond the physical exhibition space. Social media channels, including Twitter, Facebook, YouTube, and discussion boards, facilitated the sharing and amplification of their endeavours, reaching a broader community of enthusiasts and stakeholders.

In accordance with Hybrid Pedagogy, for 8 consecutive weeks, students were provided additional time slots to explore, think, evaluate, and exchange ideas, and they were encouraged to use office hours along with both asynchronous and synchronous communication channels, while the decision-making was conducted together so that the concept of 'blurred' teacher-student roles was secured. Besides the public book reading and a lecture on Mary Shelley which were offered as one of the instructional practices that can provide a solid foundation in the Romantic period and the novel, the students were encouraged to conduct thorough research on their own and look for the appropriate literary or cultural material which could inspire or instruct them to find out more about the topic, the book, about the Romantic movement, culture of the epoch, etc. Extensive reading resources were provided on the college website, and regular office hours were organized weekly to check the groups' progress. The workshops were public and open-accessed, so other students and visitors could interact with the participants.

In the final public event, the project outcomes (deliverables) were presented to the audience: Franken-robot, Franken-book-covers, Franken-IT. Visitors could play with a moving robot, watch videos and simulations, or vote for the best book cover design. A website was also launched (<http://vstss.com/frankenreads/>) that could be navigated from one of the onset computers, and dramatic enactment of a fictional interview with Mary Shelley was performed.

7. CONCLUSION

The project assignments served as a bridge to students' future professions in an event agenda that could have easily been a real employment project. However, thematically, the project topic and the literary reference went beyond their usual scope of interest. It raised some interesting questions: Can you design a Franken-related website if you have not read the book? How does a visual identity derived from pop culture interfere with the existing preconceptions of a novel? How to measure the learning outcomes in such a collective experience?

Although significant time and discreet teaching instruction (it was more of an intervention than imposed teaching) were dedicated to teaching Frankenstein and Romanticism to engineering students, what we see from the project outputs (Figures 1, 2, 3, 4, 5 and 6) is that their project designs borrowed much of the visual identity derived from pop culture. In other words, the existing preconceptions of the novel or what I earlier named 'cultural syncretism', materialized in the general use of green colour and a typical bolts-in-the-neck Franken-look, indeed much influenced their representations of Frankenstein's identity. Some of the students were inspired by the official frankenreads.org website logo, which also depicts Frankenstein as a green ogre. Regardless, none of the students offered innovative, bold designs based on their personal impressions of Frankenstein, which would seem less of a replica, or just more daring. I would say that the students decided to communicate with the audience who, like themselves, usually have humble knowledge of the topic. One of the reasons for such project outputs lies in the fact that the majority of students confessed that they did not have to read the book to be able to partake in the project activities. They felt that what they read or heard about the novel was sufficient to participate in the assignments. As they reported, and what could be observed during the workshops, their main challenges along the way remained those of the engineering nature, whereas those of the thematic/literary concept were somehow disregarded; they were more concerned about how to wire a robot properly and which batteries to use; how to program the website to be compatible with android phones; whether the book cover design was created according to the CMYK requirements? The predominance of engineering-related challenges with students somehow emerged naturally. In addition to this, some of the students had concerns about whether their participation in the project would affect their final course grades.

As for the knowledge gained, the Frankenreads project did address some of the students' misconceptions about the novel itself and Romanticism as a movement. Although it seemed they were mainly curious only about the Frankenstein trivia and were satisfied with a simple plot analysis of the novel, the majority of students still gained new competences in literature, as they learned how to approach the topic and how to search for resources. As the Hybrid Pedagogy approach suggests, learning was conducted through a meaningful, natural collaboration and ideas exchange, without any forced influences or teaching demands. What is crucial, the students were all thrilled to have been able to contribute to the project, and they confirmed that they enjoyed the process.

What were the key takeaways? Firstly, students learned that their future customers may well be not only picky, but also well-informed and quite literate, so in order to create content for a bigger outreach offering non-original repackaging of prior solutions might be condemned as mere recycling of the people's general visual memory. These students, belonging to the Instagram generation that usually gets captivated by visual stimuli, now learned to explore the brevity of a text (or literature, broadly speaking) to extract more of

the overall epistemic value so that more impactful content can be created. What prevented them from showing more grit in project design might be a cautious attitude of theirs that turned out to originate from their shyness or lack of boldness, or it just came as a logical consequence of the necessity to emerge deeper in creative thinking and design thinking so as to unlock their full potentials. One of the reasons might be also found in the fact that the differences between low-culture and high-culture contexts had not been pre-taught in detail so the students had no awareness how these differences might cause misunderstanding in the realm of international business communication (Bakić-Mirić et al. 2023). Secondly, during the process, these students came to realize that in order to avoid plagiarism of any kind and offer fresh and innovative solutions, they needed to carefully assess the trustworthiness of the sources used in a project, which I would say is an important lesson learned. This lesson is particularly significant when engaging with classic literature, even if only a few chapters have been read. Finally, students learned that the rich world of literature only complements the world of engineering and science and that we should never do without it, as the humanities give our lives meaning and depth. The transformative power of the humanities lies in the fact that they provide initial guidelines for all of humanity's aspirations and needs, as people first envision things and expose their ideas in their writings, much long before engineers even dare to craft them.

What might have helped students explore the novel more (and thus deliver more quality solutions) is a special edition of Mary Shelley's *Frankenstein*, designed "for scientists, engineers and creators of all kinds", in particular for STEM students (Guston et al., 2017). Unfortunately, we were not aware of the existence of the book as it had been published a couple of months prior to our project planning phase. However, the book might have served as a wonderful source to bridge the gap between the imaginative world of Shelley's *Frankenstein* and the innovative minds of young STEM enthusiasts, sparking an interdisciplinary fusion of literary source and their perspective of the set assignments which would have brought more depth, relevance and context to the outcomes. Apart from extensive annotations throughout the chapters, which have been meticulously done by a range of scholars, this edition contains suggestions for further reading, several essays and a set of discussion questions (p. 264-273) aimed at inciting thought-provoking debates between students and educators. The annotations provide a wonderful array of data on robotics, artificial intelligence, science history, electricity and medicine, among others.

What stands out in the introductory part of the book, and what makes it a handy resource for projects like this, is the idea that until now *Frankenstein* "has been primarily edited and published for and read by humanities students" (Guston et al. 2017: xxiii) and that this edition was designed with a didactic purpose. Interestingly, the authors' intentional design of the volume comes as an acknowledgement of what STEM students and educators might struggle with when dealing with *Frankenstein*. Namely, after announcing that the novel is about "our individual and collective responsibility for nurturing the products of our creativity and imposing constraints on our capacities to change the world around us" (Guston et al. 2017: xii), the editors deliberately defined the word *creature* as a noun which has "a more neutral, descriptive, and pedagogically appropriate denomination" (Guston et al. 2017, p. xii). What is more, the authors emphasized that their intention was to raise awareness of "the cautionary nature of the tale or on the part that continues to inspire students who believe that they can do better—as creative and responsible thinkers, makers, researchers, and citizens (Guston et al. 2017: xvii). The editorships' strong didactic inclination towards this grandiose and versatile piece of art was additionally confirmed in the essay "Traumatic

Responsibility of Victor Frankenstein as Creator and Casualty'' by Josephine Johnson who opened up with the didactic take on the responsibility, only to dissect it into what Victor could have done differently (Guston et al. 2017, p. 201), and conclude that irresponsible actions in scientific endeavour have serious consequences. Other essays in this volume also highlight the themes of Victor's hamartia – using science not to secure betterment for humanity but to achieve glory (Bear in Guston et al. 2017, p. 232) or, similarly, resonate with the idea that intentions to improve a human (bioengineering) is indeed bioterrorism that calls for a radical ethical rethink (Mellor in Guston et al. 2017, p. 239-244). These ideas underscore the imperative for a more pronounced integration of the humanities' principles within STEM pedagogy in projects like this, which might provide learners with a much more profound sense of context and social conscientiousness and less of the technocratic apparatus solely focused on scientific achievements and advancements per se.

It is, finally, clear that engineering education would only benefit from similar projects. Of course, another question is how often and to what extent similar projects could be implemented in the curricula so that they do not remain in the category of an incidental experiment. For this particular project, the Hybrid Pedagogy was chosen as the most adaptable approach, allowing unobtrusive teaching to be delivered so that active student agency, collaboration, and curiosity are maintained throughout the process. However, we must bear in mind that, due to the high flexibility of the approach, there were no mandatory activities or grading which would allow for the student efforts to be acknowledged. Another point that could affect the more frequent implementation of similar projects is the time reference. As activities are time-consuming and require additional off-campus engagement, a number of selected projects to be realized during one educational cycle should be carefully planned in advance. I suggest choosing projects of a bigger volume once in an academic year, since, as seen from the workshops, the more significant or bigger the project, the more excited students get.

To conclude, from what this project indicates, it looks like you can design a website if you have not read the book, as the global culture of Frankenstein is so strong and rich that the young people's perception of Frankenstein as a monster hallmark, no matter how inaccurate or romanticized, is almost inherent in them, as it is what they grew up with. This confirms that with the archetypal quality of the book character embedded in our collective knowledge with the cultural legacy so impeccable that, to comprehend its main values, you are NOT required to 'dissect' the novel and master the theories of literary scrutiny, and those memorable and extraordinary assignments can still be realized. Maybe that is enough in times of cultural crisis that emerges nowadays, especially for those who are referred to as 'Digital natives', although we, who major in the Humanities, would like to broaden and deepen the literary perspective of such projects, especially with young people, as they can add a real transformative value in their experiences.

Finally, engineering is considered a desirable career choice due to the economic stability and high employability rate it provides. In 2010, UNESCO delivered a comprehensive Report on Engineering which states that the goal of the UNESCO Engineering Initiative (UEI) is to increase the number of students studying engineering at the tertiary level to improve the overall socio-economic development of societies (UNESCO). However, the adequacy of the current engineering education across European countries might be a matter of discussion especially when it comes to analysing what happens when graduates find jobs. Namely, in situations when they experienced a

lack of engineering workforce in the market, many employers (Google, IBM) reported satisfaction with the humanities-based educated employees they hired instead of engineers (Krsmanović). This implies that engineering educational policies, as a public value, should establish a more holistic perspective on education with a strong emphasis on acquiring core concepts in the Humanities, instead of insisting on building rigid syllabi within too narrow technological disciplines. Building upon this, our Frankenstein project suggests that we should always valorize the epistemological value of the Humanities as a field with fantastic potential to facilitate our understanding of the world we live in. To start with, implementing any authentic humanities-related project using Hybrid Pedagogy, such as this one, is a promising beginning for more meaningful and impactful engineering educational contexts.

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APPENDIX

All photos in this paper are credit by the author.

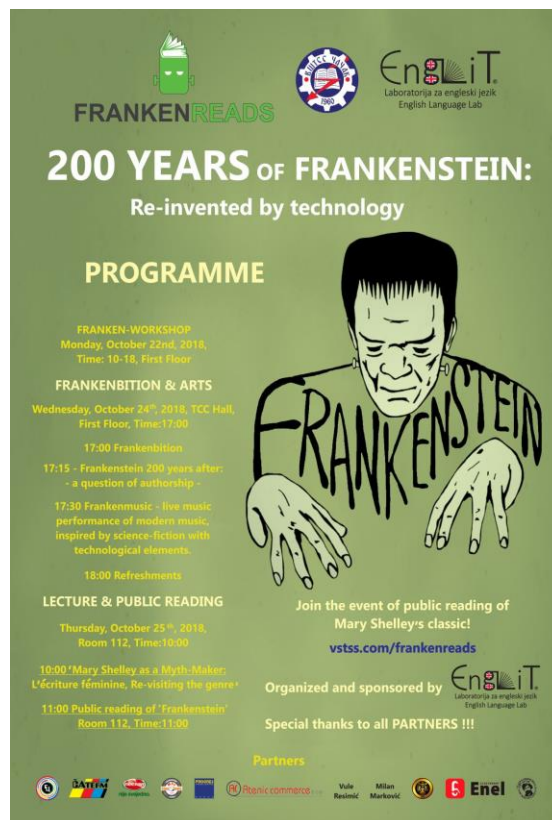


Fig. 1 Event flyer/poster



Fig 2. A Franken-robot in the making



Fig 3. The final event

Introduction:

DJ: Today we have the one-in-a-life-time opportunity to speak with one of the most intriguing authors of our time, lady who has become a voice of many, the pioneer of a whole new genre, science-fiction. I would like our guest to enlarge about the circumstances that affected creation of her book as well as her expectations of its future. When I say circumstances, I mean the role of the woman in romantic society which by no means is associated with the role of a housewife or a mother.

DJ: To start off lightly, can you tell me something about your upbringing and the beginnings of your literary journey?

V: I find it no surprising that being the daughter of two fruitful writers, I would think of writing so early in my life. My favorite pastime was writing stories, but even dearer to me was constant wondering, and following lavish trains of thought. I used to write beneath the trees near my house, but also in the foggy, gloomy, desolate parts of Scottish countryside, which I visited often. But as everything must come to an end, harsh reality soon took the place instead of my imagination. I had my own family now and started leading an ordinary life deprived of any form of writing. Nevertheless, being wife of such a famous poet as Percy Shelley I somehow approved of his idea that I should prove myself worthy of my parents' name, so, in the summer of 1816, we visited Switzerland and became the neighbors of Lord Byron.

Fig. 4. An excerpt from the play



Fig 5. The winning book-cover design and its author Miloš Damićanin



Fig 6. The setting scene for the drama enactment



Fig. 7 The audience at one of the events

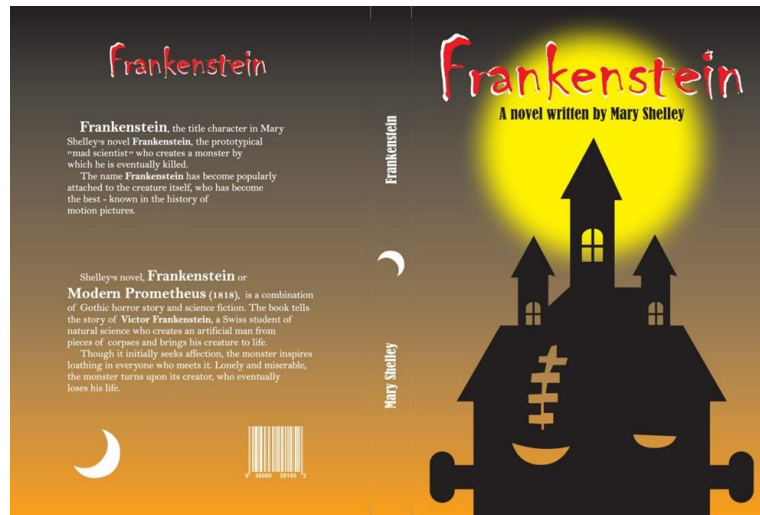


Fig. 8 One of the book-cover designs, by Đorđe Popović



Fig 9 Serbian editions of the novel, a display



Fig.10. The official Twitter account of the frankenreads.org announcing Serbian events



Fig 11. Vanja Čolović in the role of Mary Shelley