A Learning Engineering Ethical Framework: Keeping the Learner Centered

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Abstract—**Learning engineering is a learner-centered practice. Its multidisciplinary approach is part of what makes learning engineering such a versatile and valuable tool for designing learning in a wide range of contexts. This paper proposes that the learner-centered component is critical to the heart of learning engineering and is what shifts this practice from a productive method for developing learning environments to an ethical practice. The learner-centered position of learning engineering will be characterized, the ethical practices outlined, and an ethical framework described. The learning engineering ethical practice provides professional purpose to the practitioner and maintains the learner as the heart of the design and development process.**

Keywords—learning engineering; learning engineering process, ethical voice, professional purpose, ethics, ethical framework.

I. INTRODUCTION

As an emerging discipline, learning engineering is "a process and practice that applies the learning sciences using human-centered engineering design methodologies and data-informed decision making to support learners and their development" [4]. Learning engineering draws from many disciplines with a goal of supporting learners [3], which makes learning engineering a useful practice in many contexts—from developing courses at higher education institutes, to creating a technology-integrated curriculum in K-12 environments, to developing online learning technology for private companies [2]. The practice of learning engineering is the same in each case and is also supported by the Learning Engineering Process (LEP) [5]. The LEP, as shown in Figure 1, is a structured development process that helps a learning engineer (or learning engineering team [1]), move through the context and problem to be solved, identification of the team to solve it, design and instrumentation cycles, implementation of the solution, data analysis and results, and iterative improvement cycles [5].
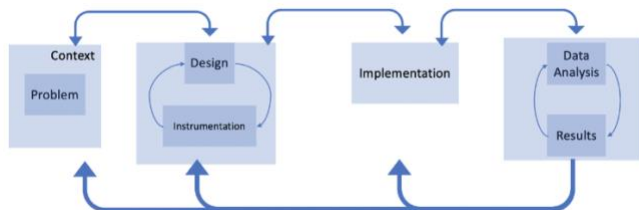

Figure 1. The Learning Engineering Process [5]

What does learner-centered mean? Learner-centered design is a common practice where the design process is centered on the learner's needs [3]. The designer considers what the goal is for the learner and determines how to best help that learner achieve said goal. Like the LEP, learner-centered design is context agnostic and is applicable in any setting. However, in the learning engineering context, there are additional requirements placed on the learning engineer in the design and development of learner-centered solutions. The consultation and application of research in the design and development of the solution is a key step at the start of the LEP, and this research-based approach ensures that the decisions being made on behalf of the learner are proven to be beneficial for them [9]. The LEP also has a series of steps that act as natural reflection points for the learning engineer (or team) to assess how the solution is operating for the learner [9]. For example, the design and instrumentation phase may have many improvement cycles as the learning engineer stops to reflect on how that design functions for the learner, and identifies potential problems or improvements. The learning engineer approaches this task by attempting to see as the learner would. The implementation of the solution is also a key moment for the learning engineer to help prepare learners to use the solution to as intended. The real-world use of the solution is as important as the intention of the design, so proper instruction for the learner during implementation is another moment for the learning engineer to keep the learner in the center of the LEP. The data analysis and iterative improvement is focused on how to improve the solution for the learner, maintaining the learner as the center of the process.

II. LEARNING ENGINEERING AND ETHICS

There are many moments in the LEP when the learning engineer is able to "center" the learner in the practice, but how does this become an ethical practice? Learning engineering as a practice is working to create something or solve a problem for the learner, and therefore, is *in service* to the learner. This service to the learner provides the learning engineer with a professional purpose, and this in turn helps the learning engineer develop and use an ethical voice during the LEP [9]. The ethical voice helps practitioners understand why they practice in addition to how they practice [6]. By maintaining a higher order professional purpose and using an ethical voice, professionals can hold themselves and their organizations to higher standards, above and beyond contractual or economic obligations [6]. The learning engineer becomes an advocate

for the learner by using this ethical voice to ensure the learner's best interests are maintained during complex development processes.

This learning engineering ethical voice, used in service to the learner, helps to conceptualize the learner as real, complex human beings. This might seem strange, because what else would the learner be? But it is not hard to develop something for the learner and yet that learner has become an abstraction or generality [8]. This abstraction is especially easy to do when the learner is not an immediate stakeholder in designing and developing the learning engineering solution [8] [9]. Using this ethical voice—derived from a purpose in service to the learner—the learning engineer can imagine the learner as a complex person during the LEP. Imagining the solution through the eyes of the learner is a method of ethical practice that helps maintain the learner in a situational context: where are they, who are they, how are they learning, with what are they learning, what is their motivation, etc.

By using this ethical voice, the learning engineer engages in a dialogic ethic [9]. The communication between the learning engineer and the learner, even when not present [8], is a form of dialogic ethics as the learning engineer strives to maintain the learner as a participant in the LEP. The ethical voice is also used in dialogic ethics by communicating with team members and stakeholders in the development cycle itself [8]. The LEP itself has several points in which the team can pause to evaluate the solution, and these reflection points are natural places for this dialogic ethic to be exercised [9].

Learning engineering provides the practitioner with an ethical approach to the discipline in both professional purpose and process, as shown in the framework of Figure 2 [9]. As a learner-centered discipline, the learning engineer has a professional purpose in service to the learner, and this helps to develop an ethical voice. This ethical voice is used to engage in a dialogic ethic with and for the learner and team during the LEP. This learning engineering ethical practice brings this practitioner group into the educational community that engages in an "ethic of caring" [7].
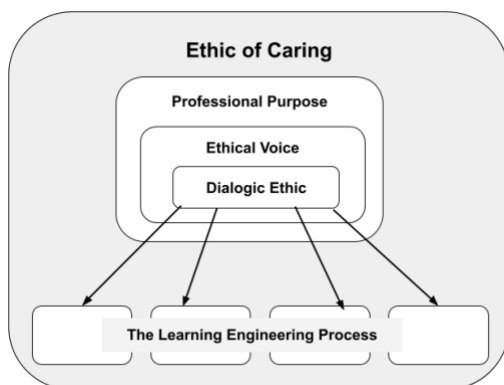

Figure 2. The Learning Engineering Ethical Framework [9]

This ethical framework is beneficial for both the learning engineer and the learner. By understanding their professional purpose, the learning engineer gains agency through use of an ethical voice. They can use this ethical voice to maintain focus on the learner during the LEP, even when confronted with challenges from other team members or stakeholders. The student benefits by receiving a learning solution genuinely created with their best interests at its center. The LEP becomes an ethical tool for the learning engineer that is used to maintain the learner as the center of the process—from initial research to design to implementation and iteration.

III. CONCLUSION AND FUTURE WORK

Learning engineering will continue to grow as a discipline and be applied in increasingly varied contexts. By actively engaging in this ethical framework, the learning engineer can maintain an authentic learner-centered practice. As learning engineers and teams apply the Learning Engineering Process in increasingly complex and diverse ways, attention must be paid to how the learner stays centered in the practice. This learner-centered ethical framework simultaneously serves both the practitioners and learners—enabling the learning engineer to use their ethical voice and tools in service of the learner.

Future work on ethics in learning engineering should focus on gathering case studies on how practitioners use ethics in diverse contexts to continue to iterate on the framework. Future work should also discuss how to cultivate this ethical approach in practice, so as to include learning engineers and teams in the educational community of ethical caring.

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