Teacher Moments: A digital clinical simulation platform with extensible AI architecture

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1 Summary

Teacher Moments [1] is an open source platform that allows the authoring of simulations used for education [3] which we recently revised to integrate intelligent coaching agents. The initial simulation development for Teacher Moments focused on teacher education [9, 2, 3], but the platform is actively used for professional development with nurses, psychologists, police officers, judges, and attorneys. Simulations can range in complexity from single-user simulations to multi-user role-play simulations [2]. Single-user simulations provide opportunities for participants to respond using text or audio inputs while multi-user simulations extend those response types to include chat functionality. To support participant learning, Teacher Moments simulations can now be configured to include intelligent coaching agents that review participant inputs, identify salient patterns in text or speech, and respond with feedback and coaching supports. Teacher Moments can be configured to incorporate text [2] or audio [3] binary classifiers or include conversational agents [4] into the chat feature. Once a classifier is configured there is functionality to dynamically display content based on audio or text classification when authoring the simulation. In addition, conversational agents can interject comments into the chat directed at either a particular participant or to all participants in a chat. Finally, there is a new integrated labeling component that supports collecting binary labels from participants for text or audio data, which can be used either to validate the accuracy of a classifier or to establish training data for a classifier. In this demo, we will: 1) highlight GitHub repositories designed to support the deployment of classifiers that can be integrated into Teacher Moments; 2) demonstrate a conversational agent integrated into the chat feature to provide intelligent supports; 3) illustrate how binary classification can trigger the dynamic display of content providing options for dynamic learning supports; and 4) demonstrate how the labeling component can be used for either validation of a classifier or collection of training data.

2 Impact

Teacher Moments scenarios are integrated in several teacher professional development programs. They are incorporated in two massive open online courses

for teachers about equity teaching practices [5] and information literacy [6]. They are used in a research-practice partnership with Grade 3-8 math teachers [1] to support more inclusive classrooms with richer math-related dialogue. In this interactive demonstration, we will share Teacher Moments scenarios from a program called Innovative New Spaces for Practice and Rehearsal in Teacher Education (INSPIRE) CS-AI.

We are currently supporting 22 teacher educator fellows in authoring, implementing (with their preservice teachers) and researching Teacher Moments simulations focused on issues of equity in K-12 computer science instruction. This focus was selected as K-12 CS teacher education programs are just starting to emerge in teacher preparation programs and injecting a focus on equity during these initial phases has the potential to shape how computer science is taught in K-12 classrooms. These 22 fellows implement simulations on average with 20 pre-service and current classroom teachers, which means roughly 440 in-/pre-service teachers will have opportunities to practice responding to issues of equity in K-12 CS classrooms as part of their teacher education programs and professional development training programs.

In addition to the 22 fellows focused on K-12 CS instruction there are around 50 additional educators at various stages of authoring and implementing Teacher Moments in a variety of contexts, but most frequently tackling issues of equity. We can outline the amount of data collected in Teacher Moments as an indicator of direct impact. At the point of writing this proposal, over 70 authors have created 400+ simulations. Over 8k Teacher Moments simulation users have provided 32k+ audio responses, 82k+ text responses, and nearly 1k chat messages (a feature we released this month). For indirect impact, if only half of the 8k Teacher Moments participants eventually serve classrooms of roughly 20 K-12 students, this would indirectly impact roughly 80k K-12 students (20*4k).

3 Relevance

The Teacher Moments platform supports distributed authorship allowing educators to author, implement, and research equity-focused simulations [3, 4]. Equity issues explored include: trauma informed care [8], equity issues in elementary computer science education [7], and beyond. Similarly, we have built an AI architecture that supports distributed AI authorship opening up endless possibilities in creating classifiers that respond to text, audio, or chat data to support in-/pre-service teachers to practice and reflect how to respond to issues of equity.

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Notes

1. Teacher Moments Code - https://github.com/mit-teaching-systems-lab/dcss

2. Text Classifier Integration - https://github.com/mit-teaching-systems-lab/dcss-sentiment-analysis-agent

3. Audio Classifier Integration - https://github.com/mit-teaching-systems-lab/dcss-confusion-analysis-agent

4. Conversation Agent Integration - https://github.com/mit-teaching-systems-lab/dcss-remote-ai-integration

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