INTRODUCTION

- Social media messaging applications (e.g. WhatsApp) reached 2.3 billion users with many users in developing countries.
- However, there is a severe lack of expertise knowledge to support those interventions.
- Expert knowledge can be scaled up using chatbots, but more research is needed to support local-language interventions or when users may not have regular internet connectivity.
- We built **DIA** a Human-AI hybrid chatbot for low-resource contexts to scale expert knowledge and support localization.

METHODS

- We deployed **DIA** on WhatsApp to mentor 38 teachers in the rural context of Côte d’Ivoire for 7 weeks.
- Teachers were encouraged to use the system whenever they needed support with teaching and there was no incentive.
- A total of 2132 messages (930 from users), more than 98% of the conversation used accurate French words.

RESULTS

- In summary, we observe from our preliminary deployment that **DIA** is feasible to mentor teachers in low-resource contexts like Côte d’Ivoire.
- **DIA** helped us collect a database of topic-specific questions from teachers and understand the unique mobile phone usage of teachers in rural contexts.
- We learned that teachers use autocorrect in French through chat logs and teachers use the internet on their smartphones intermittently during the week through message delivery logs.
- We were also able to collect teaching-related survey responses from teachers.

DISCUSSION

- In summary, we observe from our preliminary deployment that **DIA** is feasible to mentor teachers in low-resource contexts like Côte d’Ivoire.
- **DIA** helped us collect a database of topic-specific questions from teachers and understand the unique mobile phone usage of teachers in rural contexts.
- We learned that teachers use autocorrect in French through chat logs and teachers use the internet on their smartphones intermittently during the week through message delivery logs.
- We were also able to collect teaching-related survey responses from teachers.

ACKNOWLEDGMENTS

We would like to thank our collaborators at Pratham, TARL, and the Ivorian Ministry for helping us set up the study. Additionally, we would like to thank our project members Eloísa Ávila, Maya Greenholt, Justin Souvenir, Adjì Yves, Fabrice Tanoh, Hermann Apke, Sharon Wolf and Kaja Jasinska for supporting our research. We thank Jacobs Foundation and a fellowship from Carnegie Mellon University’s Center for Machine Learning and Health to V.C. for funding this work.

DIA: A Human AI Hybrid Conversational Assistant for Developing Contexts

Vikram Kamath*, Tim Brown*, Amy Ogan*
* Carnegie Mellon University, +Carnegie Mellon Africa

APPENDIX

Figure 1: The cumulative usage of **DIA** by the teachers every hour. Teachers use the system on Saturday afternoons or after school hours.

Figure 2: Shows the architecture of **DIA** consisting of (1) intents of automated interactions (2) Knowledge-base of curated questions (3) Experts who interact when 1 and 2 fail to provide an appropriate response.

- **Intents**: consists of simple pre-built conversations for engaging in small talk (such as greetings, introductions, jokes). These pre-built intents are triggered upon a keyword or a specific command for e.g. *Tell me a joke*.
  Additionally it has two modules of actions and surveys.
- **Knowledge-base**: is the database of content-specific questions that form the core curriculum of the chatbot interactions, they are curated by seeding the chatbot with data initially or by dynamically building from the database by interactions with experts. e.g. *How to Implement TaRL?*
- **Experts**: form the final source of content when the chatbot fails to assign appropriate automated response. Our system gives the user a choice to request help from an expert, following the HCAI principles e.g. *(I am sorry, I don’t know the answer to this, would you like me to ask my superior and get back?)*

*Vikram Kamath*, Tim Brown*, Amy Ogan*
*Carnegie Mellon University, +Carnegie Mellon Africa*