

# DISHA: DISease and Health Awareness for Children on Multiple Input Devices

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**Abstract**— Much recent work in multiple input use scenarios for children's learning software has focused either on math or on English language learning. The persistence of under-information among children in the developing world on issues of hygiene and disease prevention remains a massive challenge within the scholarly community in public health, especially in the developing regions that multiple input learning technologies are designed for. DISHA is a collaborative platform for public health information for children in low-income regions using multiple mice. The system is designed towards collaborative use of screen resources.

**Index Terms**— Computer Aided Learning, Multiple Mice, Developing Regions, Health Education.

## I. INTRODUCTION

GLOBAL health statistics show a staggering amount of deaths and disabilities due to preventable diseases including respiratory infections, diarrhea, malaria and tuberculosis that almost exclusively impact the developing world [1]. The issue of public health education is a relatively unexplored area within the domain of Computer Aided Learning (CAL), despite past evidence of effectiveness of audio-visual material for hygiene education, as well as the currently prevalent use of animation in static learning materials for children. With DISHA, we aim to supplement CAL programs, increasingly prevalent in the developing world including many areas with high risk of some of the aforementioned diseases. DISHA encompasses every aspect including the symptoms, prevention and cure of these diseases. Using a narrative-interactive loop format of story-telling followed by multiple choice Q&A, DISHA uses MultiPoint technology [2, 3] for healthcare learning material. The Q&A enforces collaboration, competition and turn taking as machine-induced interactive modules, following a game based approach.

## II. IMPLEMENTATION

Giving each child a mouse of his or her own, DISHA aims

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to both spread the use of a single computer wider across all users as well as increase engagement between the children. We adopt a hybrid approach of racing and unity models [4], thus two teams of children play against each other by connecting to a server, thus ensuring collaboration among the team mates and competition among the teams. An Artificial Intelligence backbone tracks the performance of individual children and distributes on-screen prompts based on the performance of children and the areas they appear to need help. The idea of profiling performance over time used in DISHA also has an important machine language element in tabulating a child's competencies that can be applied across various learning subjects for young children, which in turn can provide useful cross-domain data on learning skills.

## III. INTERFACE FEATURES

We employ in our design features that have been seen as effective in past trial applications with education in the developing world. This includes some standard design principles of gaming including goal-based progression, competition, positive reinforcement, personalized scoring and other principles specifically relevant to ICTD such as Same-language Subtitling (SLS) and color and shape-coded mouse pointers. The interface is designed intuitively for a child's use, assuming minimal availability of teachers.

## IV. DEMONSTRATION

We demonstrate (a) on a single laptop with four mice the use of DISHA in a real world, (b) two teams playing against each other on two laptops connected to a server.

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