An incremental approach for building a dialog based intelligent agent for guided learning.

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Table of contents

Abstract A text-based AI conversational agent would allow guided learning to be more personalized and adaptive to the needs of its user. Part of the solution is developing an interface through which the conversational agent interacts with a user and other part lies in developing courses as scripts which are to be used by the agents to instruct a user to learn a subject. Such a system would allow for greater freedom to enhance user knowledge database which was not earlier possible. Apart from learning, the interface would also the user to retain his learning through generated personalized notebooks and utilizing spaced-repetitions.

1 Introduction

The idea of building a conversation agent stems from the need to build a platform where a learner will be able to understand, evaluate and base his decisions by accessing the large amount of knowledge that is continuously being generated by human beings. Part of reason for the inability to access such large amount to knowledge may be attributed to **prerequisites debt**, inadvertent denial of access, high opportunity costs, high perceived barrier to entry and the issue of self discipline resulting from decreasing attention span of learners.

In order to understand why the traditional methods of guided learning such as textbooks, recorded lectures and instructor led learning fails to guide students, we look at the following cases.

1.1 Bloom 2 Sigma Problem

Educational psychologist Benjamin Bloom found[1] that using mastery learning, one-on-one tutoring led to a two sigma improvement in student's performance over the students who were instructed using conventional methods. In the paper, he posed the question *"How could we replicate the effectiveness of one-to-one or small-group tutoring in a more cost-effective, scalable way?"*. This he termed as the Bloom Sigma problem.

Also the study regarding the effectiveness of direct instruction [2] shows that the effects from direct instruction using mastery learning are large. The paper notes that *despite the*

very large body of research supporting its effectiveness, direct instruction has not been widely embraced or implemented.

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6.1 The need for Primer

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