



Computer Science
UNIVERSITY OF TORONTO



VoiceEx System

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Outline of Talk

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History of VoiceEx
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02 Data Collected
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OVERVIEW

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What is the VoiceEx System?

- Open-source web application which allows to collect responses using text and voice input.
- Created for educational purposes.
- Live-transcription.
- Immediate submission check: length and keywords.
- Additional (optional) checks: context and language.

The History of VoiceEx - (*Voice Part*)

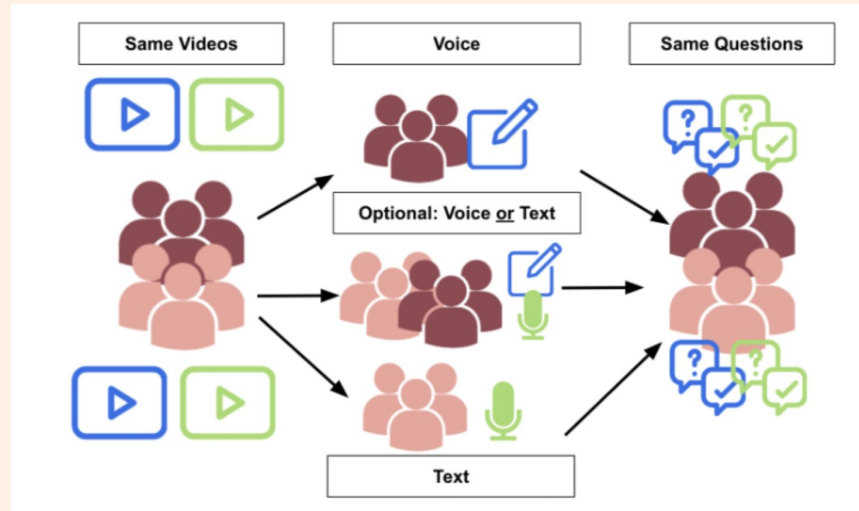
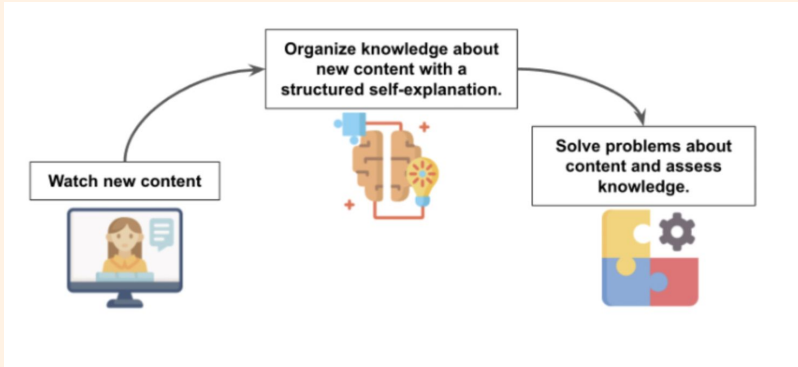
- How do people complete open-ended questions in surveys?
- Conducted a survey in Summer 2021.
- A/B tested medium of answering open-ended questions:
 - Text
 - Voice
 - Choice: Text or Voice
- We found:
 - Female students tend to respond more than male students overall
 - When given the option, female students preferred to use voice and male students preferred to use text
 - More extensive responses by voice.

The History of VoiceEx - (*Ex* Part)

- What are the positive effects of using self-explaining prompts in learning?
- Asked students to self-explain course concepts in a flipped classroom.
- Course: Introduction to Databases.
- We found:
 - People who self-explained needed fewer submissions to get the right answer on questions that assessed the topic they self-explained on.
 - People who self-explained meaningfully appeared to get a better grade on subsequent assessments that checked the topics they self-explained on.

VoiceEx Purpose & Use-Cases

- A/B test the way students respond to prompts using different mediums.
- For instance, how does self-explaining impacts learning if done using different mediums?



Who uses the VoiceEx System?

Various Computer Science courses at the University of Toronto
Mississauga (UTM):

- Introduction to Databases
 - Reflection on course concepts before putting them in practice.
- Introduction to the Theory of Computation
 - Reflection on feedback provided after completing a course assignment.



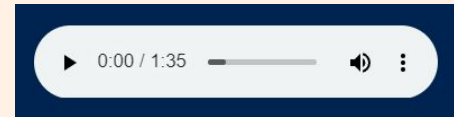
Data Collected

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Data Collected

1. **Student Unique Identifier:** we integrated VoiceEx with UofT's authentication system.
2. **Condition(s):** assigned conditions (voice-only, text-only, choice).
3. **Submission(s):** for voice submissions, we store not only the raw audio file, but also the transcriptions using Azure's Speech-to-Text APIs and time stamps.

```
projectName: "assignment-2"  
courseCode: "CSC236"  
identifier: "chenpan-assignment-2"  
filename: "chenpan-CSC236-assignment-2-1669409038864.webm"  
path: "voices/chenpan-CSC236-assignment-2-1669409038864.webm"  
createdAt: 2022-11-25T20:43:52.775+00:00  
uid: "5622490a-c7e9-45c6-8efb-75fd5a62cdb5"  
feedback: "Congratulations, your reflection is complete!"  
passed: true  
transcription: "Hello. Hello. Hello."  
wordCount: 3
```



```
projectName: "assignment-2"  
courseCode: "CSC236"  
createdAt: 2022-11-25T20:51:55.456+00:00  
submissionId: "5622490a-c7e9-45c6-8efb-75fd5a62cdb5"  
questionOrder: 3  
answer: "asfasf"  
wordCount: 1
```

Analysis of the Data

We can evaluate the data collected based on the response condition assigned.

- Quantitative:
 - Length
 - Attempts
 - Time of submission
- Qualitative:
 - Content
 - Type of reflection

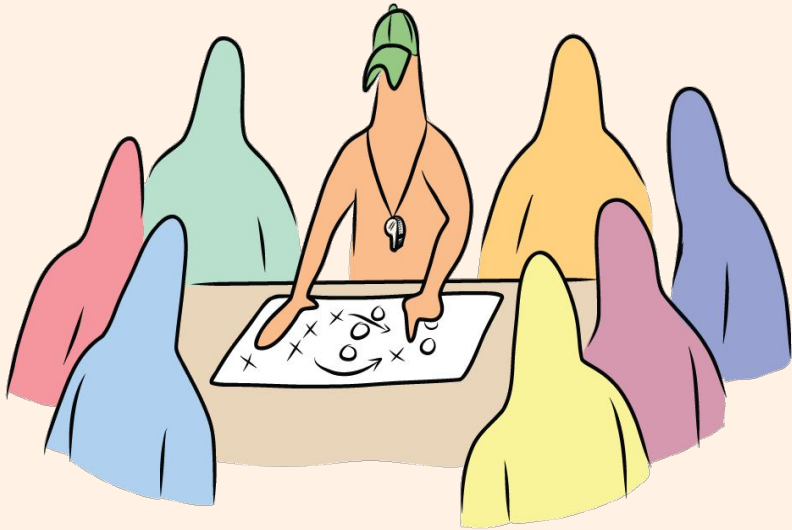


VoiceEx Demo

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Demonstration

See our demonstration



Try it yourself!



Conclusion

- The *VoiceEx* tool allows to collect students' responses using different mediums.
- The tool can track number of attempts, transcription, and length.
- The data collected can be mined for further educational improvements and research!



Q&A Period

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Q&A Period

Thanks for Listening!

Please feel free to ask any questions!

If you want to collaborate with us or learn more about what we do, send us an email at:

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