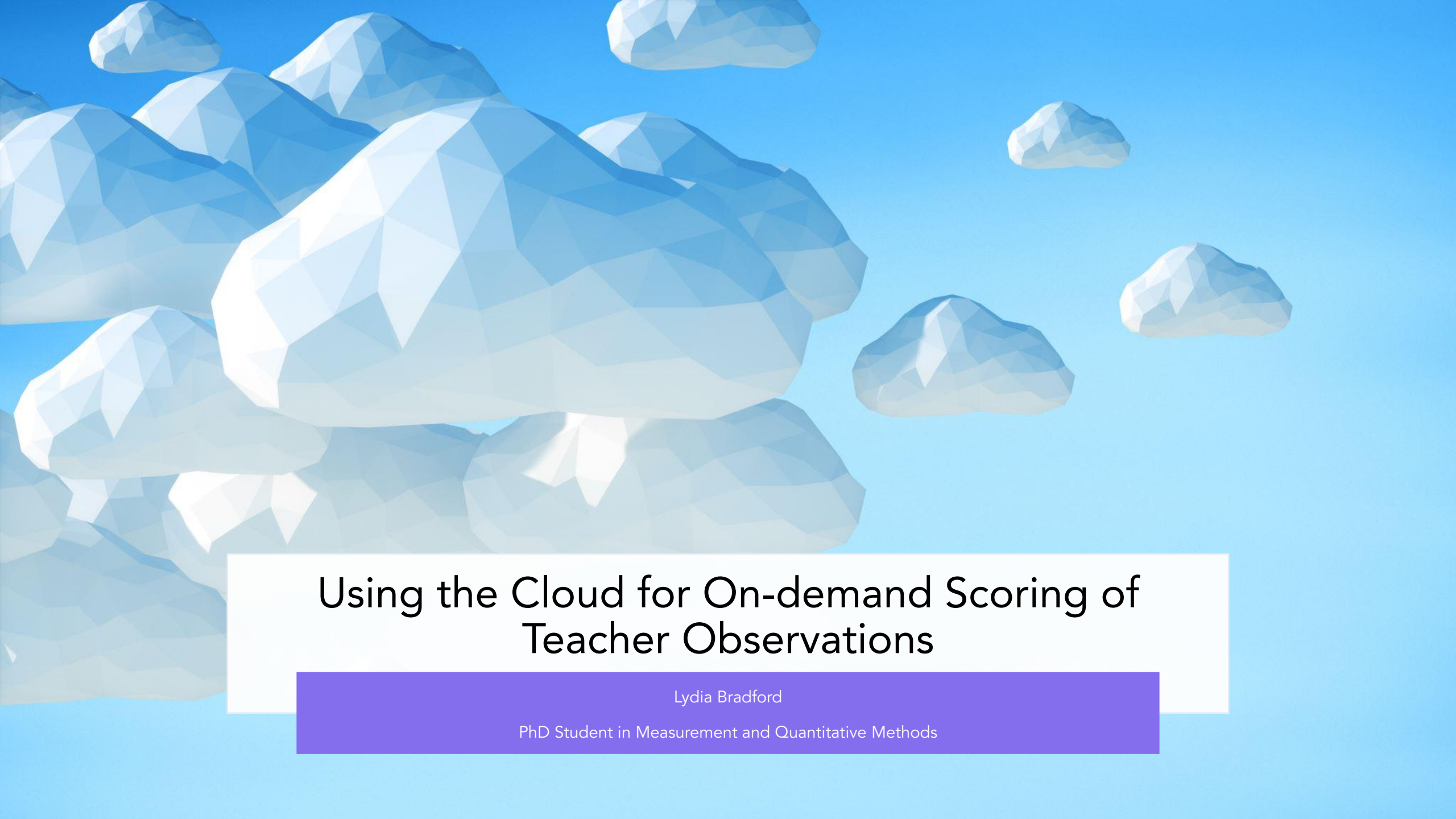




# Using the Cloud for On-demand Scoring of Teacher Observations

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## Goal of the Project

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1. Create a system where the prefit machine learning model is able to be accessed across the research group for teacher observation scoring
  1. Immediate goal: Send a new data point to the deployed machine learning model and have a score returned for the data point

# Background

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- Teacher Observations
  - Used in education research
    - For mediation analysis and fidelity of implementation
  - Used in education practice
    - Evaluating teachers for their professional development or performance-based compensation
  - Costly to conduct





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## Previous Research

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- Using 2 randomized control trials on a project-based learning science intervention, trained and fit a machine learning model to score the observation protocol (used the same protocol) from the observer's notes.

# Machine Learning Model

## Data

- Observation protocol:  
~50 questions: scores and texts
- Data format:

```
{'score':[],'observer':[],'question':[],'text':[]}
```

Where score is from 0 to 4, observer is the observers' assigned number as a categorical variable, question is the corresponding question from 1 to 46 as a categorical variable and text which is the notes from the observation.

## Models

- Preprocessing data:
  - Encode observer and question into matrix of dummies
  - Text variable into matrix of text counts
- Model:
  - Logistic regression trained on previous data from the 2 RCTs
  - Fitted model saved in pkl file

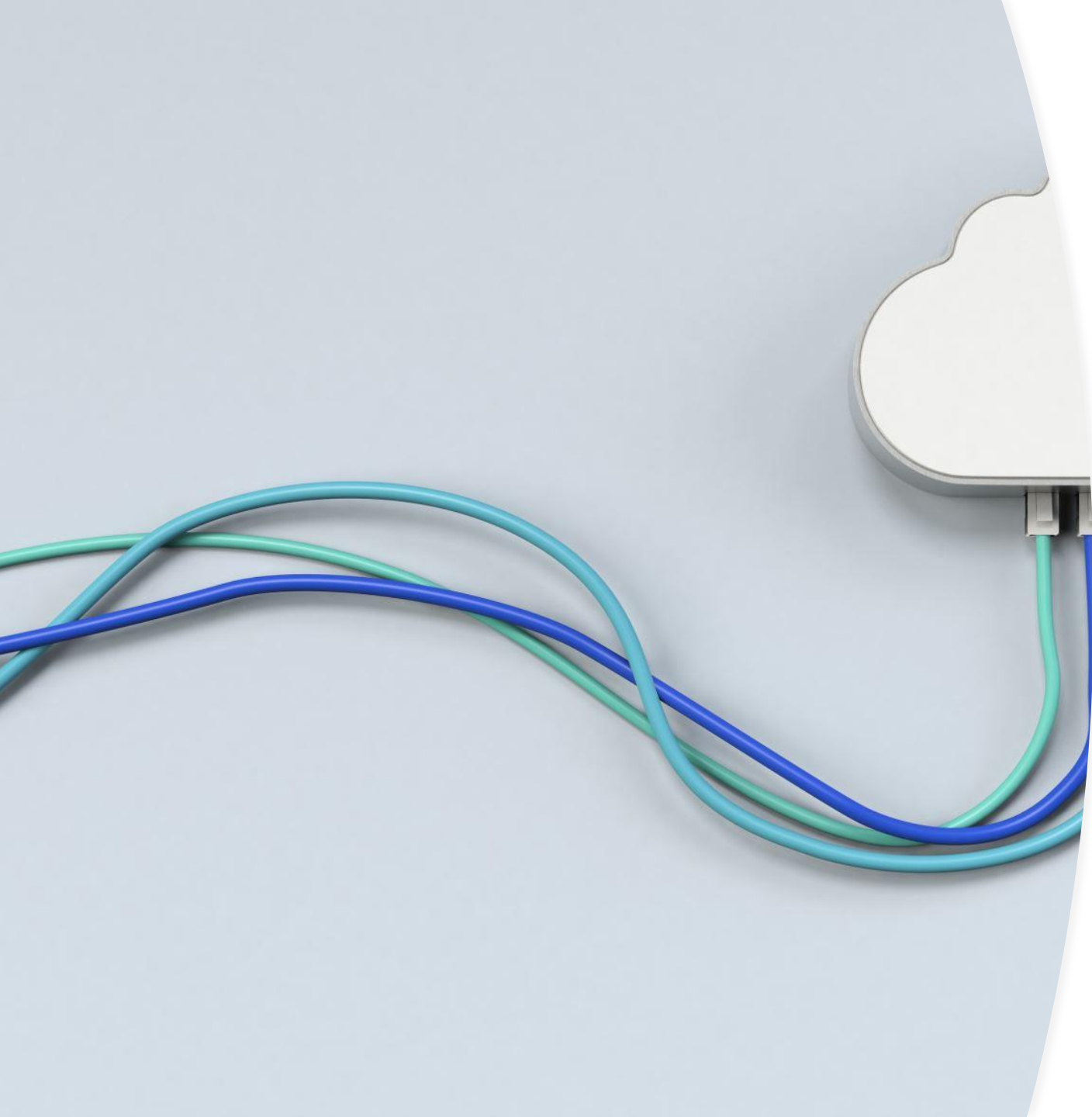
# New Problem and Solution

## New Problem

- How can this model become more accessible to the rest of the research team to score their observations?

## Solution

- Using Cloud resources to register the model and make it accessible to the research team



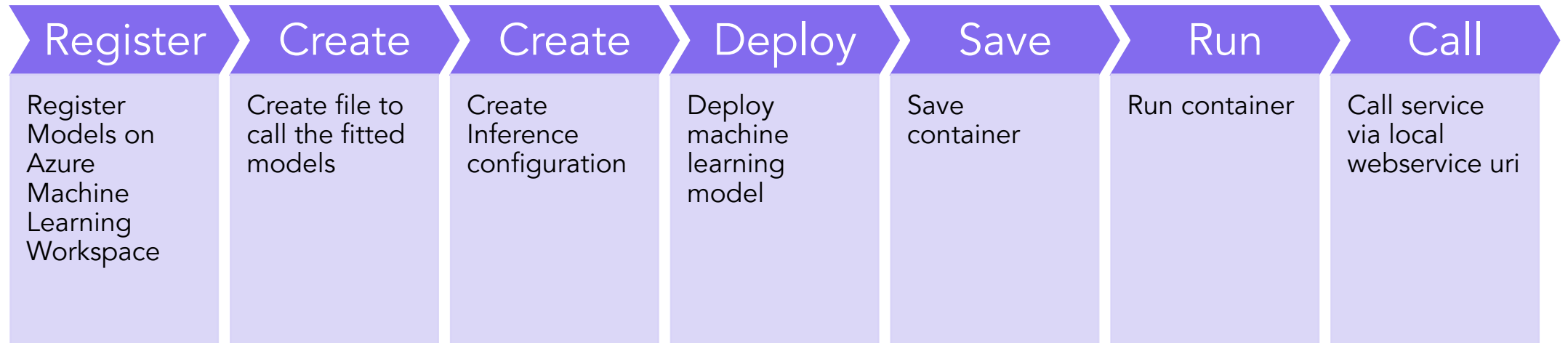
# Cloud Resources Used

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- Azure Machine Learning:
  - Workspaces
  - Model
  - Inference Configuration
  - Local Webservice
- Containers



# Process





# Successes and Challenges

## Success

- Azure ML workspace was easy to use and cost effective
- Used the local webservice to call the model with new data
  - Received a fitted score

## Challenge

- Issues with using new data with prefit models
  - The prefit models for data preprocessing and the machine learning model limit the structure of the data and the future generalizability
  - Future solutions: updating model for new categories

# Current Products



Container to run for the local webservice



Py file to use as an example to call the service using new data



## Future Work

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- Move the local webservice to an azure webservice
- Create user friendly interface to call the service
- Expand work into other observation protocols

