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Introduction to Machine Learning

Reflective Report

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Lesson Summary

**Title:** Introduction to Machine Learning  
**Target Audience:** Year 9 Students (Ages 13–14)  
**Duration:** 45 minutes

how this technology can be applied in their daily lives.

Evaluation of Lesson Delivery Across Sessions

The three delivery sessions of the lesson material proved effective in translating the structure defined in the original lesson plan into classroom practice. The Slido word cloud, later replaced by a selection of quiz questions, served as an interactive tool. This was used to provide immediate feedback on students' understanding of their prior knowledge and to determine if the taught content was being understood.

The competitive nature also kept students focused throughout the lesson, which was a pivot from the original plan's objective to “review word cloud responses to evaluate baseline understanding”. The pivot occurred because students had the ability to add free text, which unfortunately did not end well in the initial session. However, the later sessions still matched the lesson plan in reviewing responses to evaluate a baseline understanding where it was instead compared against closed questions and answers.

The practical exercise using the Google Cloud Vision API received the highest level of student engagement across all three deliveries. Students followed the Hands-On ML Exercise procedures in the lesson plan by uploading images to analyse labels and discuss unexpected results such as the misclassification of certain animated characters, which generated important discussions about AI accuracy and bias. Students successfully critically evaluated how AI performed through the application of ML concepts in Google Cloud Vision image data analysis.

In addition, the implementation of a real-world case study through construction delay prediction proved helpful in the lesson. The lesson plan divided complex problems into manageable steps, which included data collection followed by model selection and training and testing phases that matched the Guided Activity structure. Students found the practical scenario easy to understand and several students proposed ML applications that could be used at school to help them with their learning.

The decision to place quiz elements throughout the session instead of placing them at the end seemed to be successful where it helped students stay engaged and participate actively. The use of sweets as rewards proved to be an easy and successful approach since it boosted student participation without interrupting the educational content.

Responding to Feedback and Challenges

The feedback from delivering the lesson helped me identify key areas for improvement that I take seriously and will work on in the future iterations as well as write down in the lesson plan. Below are some points that have been raised in which I intend to address.

## 1. AI Image Usage and Transparency

In the first session, I highlighted that all presentation slides included AI-generated images. The following sessions lacked the consistency that I had established initially. The mistake was clear because this lesson focused on transparency and data ethics it was more the fact I rushed through the slides and missed some key information. I understand the importance of giving credit or reference, especially in terms of any AI-generated content. It is essential to acknowledge the role of AI in my work to highlight its possibility and to highlight that it is not my work. I think this is especially important as it can lead to further discussion.

## 2. Audience Interaction

In the lesson plan, there are prompts like ‘Where have you encountered AI in your life?’ However, I sometimes failed to do so in the subsequent sessions and instead provided examples too hastily. I should have encouraged a more open floor discussion to increase participation by asking the students to provide examples first. This will increase student engagement and also start to get learners thinking of how this topic is relatable to them. This could lead to better adherence to the plan that emphasises on active learning.

## 3. Technical Accessibility and Pacing

Although the lesson was designed for students with basic computing skills, such as browsing the internet, it became clear that some students faced challenges with certain aspects. This included downloading files and using the drag-and-drop feature with the Google Vision API. I did try and minimise this by providing a short walkthrough video and walking through this in real-time, but I now realise that some students may require more support, especially for lower-confidence groups. A step-by-step printout guide would offer the necessary support. The guide would also include shortened URLs using Bit.ly. This was added to the slides for the 2nd and 3rd session but having it on the guide would make it more readable and more accessible for each student.

## 4. Case Study Slides Too Text-Heavy

Through my feedback, the case scenario slides (Slides 14–20) had ‘way too much text’, and I agree that this made it difficult for the students to get the main points. In the revised plan, I plan to replace the heavy text blocks and replace them with visual timelines and icons that simplify the ML pipeline (data collection →, training →, testing →, evaluation). The teacher would briefly summarise each step as the slide is presented.

## 5. API Terminology

Although the lesson had the students working with an API (Google Cloud Vision), I never explained what exactly an API is. However, since the educational setting, even a brief explanation such as ‘API is an abbreviation for Application Programming Interface, and it is a tool which allows the software to communicate with other software’ would have been in line with the plan’s aim of introducing basic computing concepts.

## 6. Repeating Student Responses

Another important, though subtle, point that emerged from the feedback was the need to repeat students’ spoken responses. In a noisy classroom with 30 pupils, it is therefore important that every student can hear the contributions. Rephrasing answers is not only inclusive but also reinforcing, and I will use this in the future.

Personal Reflection on Teaching

The experience of teaching this lesson turned out to be one of the most fulfilling experiences I have had during my university academic experience. This shows that teaching is not only about displaying information but also about encouraging students’ interest, especially when the topic is futuristic and very topical, like AI.

At the start of COMP335, I said I wanted to explore how computing could empower younger audiences. This experience has brought that goal to life. This experience also supported my interest in education and outreach, but I had no idea how I would perform in the classroom. I gained more confidence in teaching, adapting the session and the ability to convey content to different audiences through several teaching sessions and feedback from both staff and students. This was a particularly positive experience, as students gained insight into how much of their life involves AI experiences, such as voice assistants and Netflix recommendations, to provide a basic understanding of the algorithms that operate behind them.

I have found that computing education is inspiring through such moments, as it enables students to understand the world through educational computing principles that extend beyond professional development. The experience has shown me the value of inclusive design, as well as the need for simple pacing and structure, which I will apply in all my future educational work and public engagement activities.

Updated Lesson Plan (Tweaks Only)

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| --- | --- |
| **Change** | **Rationale** |
| added a short definition of “API” as it explains the exercise | Ensures that further key computing terms are explained in simple language to provide a foundation into the task. |
| Include slide prompt asking students for examples of AI in their life before other examples are provided | Increases engagement and inclusivity |
| Replace case study slides’ dense text with icons and diagrams to represent the ML process. | Supports visual learning and improvement to the slides based on the feedback provided |
| Add a footer note stating which images are AI-generated on the reflection slide | Ensures transparency and models ethical content use. |
| Add a note to the lesson plan as a general point to repeat student responses aloud to ensure the whole class can hear. | Addresses feedback about classroom inclusivity. |
| Provide a step-by-step guide for the students to access materials and exercise. This is to be printed out if the session is to be run again. This is in addition to video. | Reduces assumptions about technical fluency and supports lower-confidence students. |

Statement on Further Use

I **allow internal use for outreach activities (Option B)**. I’m happy for my lesson and materials to be used in future outreach efforts within the university or adapted by others involved in school visits or engagement. I’m proud of the work and would be glad if it helps inspire more students to explore computer science.