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Design & Technology Lesson Plan Analysis

102086 Designing Teaching & Learning

Lesson Plan Analysis – QT Framework

1 Intellectual quality

1.1 Deep knowledge

4	Delivered through engaging multimedia content scaffolding to build complex knowledge about the topic area, evaluating impact of past technologies, addressing outcomes DT5-3, DTLS-3, and DT5-5, assessing risk, design flaws, and proposing solutions. Key ideas in addressing outcomes DT5-2, DTLS-2 are sustained with teacher guided discussions and active informal assessment utilising individual and group activities. Though related to foundation building, the content of the lesson doesn't differentiate for outcome DTLS-9, which is mentioned in the plan.

1.2 Deep understanding

5	Deep understanding is assessed by comparative assessment of prior knowledge; using worksheet activities; and homework task to assess students' demonstration of deep understanding. Students are urged throughout the class to reflect in group and class discussions, with teacher guidance, additional scaffolding content and input of other students, allowing for opportunity to clarify misunderstandings, solidify relevant knowledge and assist with connection to new information.

1.3 Problematic knowledge - *Key area addressed in original lesson plan

5	Class discussions is utilised to integrate predictions and proposals, to consolidate multiple perspectives for analysis. Historical design failures are discussed to indicate social construction of historical design knowledge, revealing design flaws, and demonstrating its impacts. Problematic knowledge is explored further by encouraging proposals for improvement and evaluating design flaws.

1.4 Higher-order thinking - *Key area addressed in original lesson plan

5	Higher-order thinking is encouraged throughout the lesson, through request of predictions and proposals, to ensure students apply logical hypothesis in consolidating prior knowledge and new information. To ensure higher-order thinking throughout majority of the class, the 'Engineering Design Process' material with lower-order thinking is strategically delivered later in the lesson after higher-order thinking has been explored. The earlier content is mostly presented as speculative to promote critical thinking. Students are given opportunity to synthesise declarative, procedural, and conditional schema knowledge, in their homework task to demonstrate higher-order thinking.

1.5 Metalanguage

2	Metalanguage discussion not evident (this may be assumed in discussion and introduction of worksheets, however there is no time allocated for this within the plan). "Fostering cross-curriculum literacy" is mentioned, but this could be improved with a mini-lesson about answering worksheet question, to tackle full sentence responses, as well as key verbs in questions to address, such as "explain", "evaluate", "propose" and "describe".

1.6 Substantive communication

4	Sufficient time allowed for student individual and group activities, to enable sustained student-to-student interactions. Planned teacher interactions during these activities assist with focus on the substance of the lesson. Communications between the teacher and students are sustained and reciprocated for classroom by encouraging student input/feedback for class discussion. Substantive communication with knowledge scaffolding occurs over most of the lesson, however this is not applicable for entire duration of class.

Quality learning environment

2.1 Explicit quality criteria

2	Explicit literacy expectations are addressed in the individual task Worksheet 1 with detailed requests about how to answer the questions. Worksheet 2 questions are explicit in the information required, but there is no mention of discussion about approaching worksheet 2 with reference to explicit metalanguage (see metalanguage above). The class discussion at 50 minutes, should be explicitly linked to the earlier material (this may be intended but is not outlined in the plan). Teacher does not explicitly inform students on how long the homework responses should be and the form fields in the Google forms do not indicate this with unlimited fields.

2.2 Engagement - *Key area addressed in original lesson plan

4	Given this is an introductory lesson, the diverse content selected, and delivery of information through inquiry and discussion is engaging for students. It is difficult to assess true engagement without seeing the class, so this analysis is deducted from the planning goals. The video material selected is engaging and interesting and supported by inquiry-based scaffolding which can guide student to maximise engagement

2.3 High expectations

5	The tasks allocated to students are challenging and draw on problematic knowledge with limited declarative knowledge provided, and students are encouraged to take risk through the chronology of content delivery by predicting and proposing solutions to a problem with little foundational information, which all indicate high expectations. Class discussions, followed by further content clarification, also enable teachers to recognise and reward higher order thinking and risk taking. The research homework task expects that students can activate conditional knowledge schemas and encourages synthesising of the lesson topic with research.

2.4 Social support

| 3 | Individual work allows for demonstration of prior knowledge in a safe environment. The group work section indicates that students can modify their worksheets during group discussions, encouraging social support and learning. Class discussions allow for consensus-building, flexibility, and acknowledgement of appropriate behaviours.

More detail to outline differentiation for students who are more reluctant to take risks would be beneficial to this lesson plan. |
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2.5 Students' self-regulation

4	Sufficient time (5 minutes) is allocated to settle down students, check for accessibility of ICT resources, and for the teacher to take the roll. This indicates an attempt at minimising distractions. Activities have clear goals, with interesting content and sufficient time allocated for purposeful attempt. Self-evaluation is encouraged in group work to update individual worksheets.

2.6 Student direction

2	The schedule is very rigid, and students do not exercise control over choice of activities, time spent or pace. However, students are involved in driving the directions of Individual, group and classroom tasks (with teacher guidance) based on discussion, feedback and communication.

3 Significance

3.1 Background knowledge - Key area addressed in original lesson plan

| 5 | Professional practice of assessment utilised to understand student background knowledge, as well as understanding how students learn, which is suitable for an introductory lesson. Students are provided a variety of activities throughout the lesson, to express prior understanding before further content is introduced.

Student background knowledge is elicited in the worksheet, and incorporated into discussions and further learning, with substantial connection through predictions and proposals about design methods and flaws, connecting to prior knowledge. |
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3.2 Cultural knowledge

N/A	Not applicable

3.3 Knowledge integration

| 2 | Indication of cross-curriculum focus on literacy in answering worksheet 1 in full sentences. Minor links made to history (historical event) in reviewing the topic of a past technology. Integrating scientific approach of hypothesis and evaluation.

Knowledge is mostly restricted to the topic area. |
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3.4 Inclusivity

| 4 | Group discussions encourages students to cooperate and be inclusive of shared ideas. Pre-preparation of printed worksheets identical to the Google form homework, differentiates for students who may not have after school access to Google Classroom. Video materials may be challenging if delivered to EAL/D students, as there are no subtitles. The Video of a bridge collapsing may have impact on any students who may have experienced any disaster trauma.

The teacher exercises professional practice by interacting with the class throughout group/individual work to maintaining a supportive and safe learning environment and keep communications open. |
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3.5 Connectedness

4	The lesson has clear connections to understanding of design processes and impacts of past technologies, reinforced with the homework task, which links the topic area to design more broadly. This introductory lesson begins to link students to design engineering outside of the classroom. The use of overhead material about "Design Engineering Process" can help establish this. The link to real lift historical event means that student may be more likely to discuss or make links to real life situations beyond the classroom. Teacher demonstrates planning for implementation of effective learning.

3.6 Narrative

5	The use of a historical case study bridges student understanding of the real-life application of design and impacts. A single narrative is used and sustained throughout the lesson with significant relevance to the topic area to enhance the learning experience about the impact of design (video), as well as design thinking (worksheets & discussions).

Identifying Areas for Improvement

QT model – Four areas targeted for improvement	
1.5 Metalanguage

Allocate time in the lesson plan for assessment of understanding of metalanguage relevant to the topic area, and allow time for discussion if necessary. | **2.6 Student Direction**

Make the schedule less rigid to give students options for pace, activity, and program order. Let students drive discussion and allow time for questions and feedback pertaining to in class tasks, homework or assessments. |
| **3.3 Knowledge Integration** | **2.1 Explicit Quality Criteria** |

Retain cross-curriculum literacy element. Build stronger cross-curriculum links, student background knowledge integration and differentiation for diversity. Integrate scientific approach to hypothesis and evaluation through building on the design process. Aim for adaptable knowledge use beyond the topic area.	Explicit expectations of student self-regulation, activity instructions, class outlines, homework and research expectations. Link topic area to final design process discussion. Tie in the lesson at the end.