Resources – other word doc

Intro and Reflection – Google doc

Introduction

Asquith Girls High School is a girl's only secondary school located in the Hornsby Shire, which serves a diverse student population. The students at Asquith Girls reflects a broad socio-economic and cultural range, which includes a significant proportion of EAL/D students. The school has a strong emphasis on academic achievement and offers the students an inclusive curriculum that values student voices, creativity, and innovation. This resource folio has incorporated both the Design and Technology and Industrial Technology Timber syllabuses for stage 6. The eight resources that I have included, form part a sequential unit of work which is designed to develop students' critical thinking, design capabilities, technical skills, and understanding of sustainability and ethics in relation to technology.

The Design and Technology resources (resources 1-4) are focused on developing a Major Design Project (MDP), which aligns with the stage 6 syllabus outcomes which include P2.1, P4.1 and H5.1. The resources that are included scaffold students' engagement in user-centred design, ideation, prototyping, and evaluation. The Industrial Technology Timber resources (Resources 5-8) support the development of skills in practical timber construction while also incorporating ICT, literacy, and numeracy skills that align with outcomes P1.1, P2.1, and H3.2.

Each resource has been designed to align with the principles of Bloom's Taxonomy and includes a range of opportunities for students to apply higher-order thinking (HOT) skills. Diagnostic, formative, and summative assessments have been integrated within the resource folio to support individual student learning progression. The activities that I have selected are catered for varied learning needs through differentiation strategies which include scaffolds, extension tasks, visual instructions, and inclusive questioning. Literacy and numeracy needs have also been incorporated by using subject-specific vocabulary tools, measurement exercises, and design specification charts.

By making sure this unit is based with the NSW NESA curriculum and incorporating relevant pedagogies such as project-based learning, Universal Design for Learning (UDL), and digital integration which includes AI, the sequence aims to support student engagement, creativity and skills students can use for future pathways.

Reflection

In the process of designing and selecting the eight resources, I used a strategic approach that aligns with current educational theories, curriculum, and the diverse

needs of students at Asquith Girls High School. Within this reflection, I outline the pedagogical rationales which demonstrate the sequencing, differentiation, and assessment approaches used within the unit.

The resources have been created in connection with Vygotsky's Zone of Proximal Development (ZPD), which allows for the effective use of scaffolding and the building up of the responsibility model (Pearson & Gallagher, 1983). The progression in relation to the foundation knowledge to the autonomous application is demonstrated in both the Design and Technology and Industrial Technology Timber sequences. For example, Resource 1 introduces the MDP through a diagnostic design challenge that assesses students' initial capabilities and preferences, which sets the stage for personalised pathways.

To help support diverse learners, Universal Design for Learning (UDL) principles were incorporated. This includes providing a multimodal approach which includes video tutorials and scaffolded handouts, engagement which includes peer collaboration and real-world design contexts, and expression through digital portfolios and oral pitches. An example of this is in resource 6 which allows high-achieving students to explore CNC routing through AI-generated pattern designs, while students that require additional support can use templates and guided tool demonstrations.

Assessment strategies were created using Black and Wiliam's (1998) formative assessment framework. Resources include rubrics, checklists, peer and self-assessment, and teacher feedback. Resource 4 and 8 include summative project evaluations that reflect not just technical outcomes but also process skills and ethical considerations.

The development of students' literacy, numeracy, and ICT capabilities was essential to resource selection. Literacy strategies include the use of design vocabulary glossaries, sentence scaffolds for report writing, and visual literacy prompts which are used to decode user briefs and evaluations. Numeracy has been incorporated within measurement tasks (resource 7), budgeting tools (resource 3), and a variety of calculations. ICT has been incorporated through 3D modelling software (Fusion360), Google classroom for classwork, and the use of AI tools such as ChatGPT for user persona development and sustainability report drafts.

Resources such as AI were not just used to create some of my resources, it was also incorporated into learning activities for students. For example, resource 2 includes a task where students use ChatGPT to generate alternative design ideas for feedback and analysis. This provides metacognitive engagement as students can compare, critique, and reflect on AI-generated suggestions instead of their own.

Ethical and professional responsibilities were incorporated throughout the resource development. Safety guidelines and required to read websites were incorporated into

lessons what involved online research and using different software's. Also respect for cultural diversity was incorporated into lessons by including sustainable design prompts and timber species selection tasks that ultimately consider Indigenous perspectives and environmental sustainability.

In conclusion, this folio demonstrates the incorporating of curriculum knowledge, inclusive pedagogies, and reflective practices that are used to support diverse learners to achieve success in TAS subjects. Using varied and strategically sequences resources, students are supported to engage in authentic, challenging learning that ultimately prepares them for post-school pathways.

Resources

Design and Technology

Resource 1: Diagnostic Design Challenge Worksheet

Title: "Redesign Your School Bag" – Ideation & User-Centred Problem Identification

Type: Diagnostic worksheet (Appendix A)

Bloom's Level: Understanding, Applying.

Syllabus Links: P2.1, P3.1

Description: Students will complete a guided worksheet prompting them to identify common issues with their current school bag, interview a peer about their needs, and sketch initial design improvements.

Annotations:

- Learning Goal: Identify real-world user problems using a design thinking approach.
- Syllabus Alignment: Supports preliminary outcome P2.1 through ideation and user needs analysis.
- Pedagogical Sequencing: As a diagnostic tool, this resource provides baseline data to inform future scaffolding.
- HOT skills: Students apply critical thinking to evaluate user needs.
- Literacy/Numeracy/ICT: Sentence scaffolds support descriptive writing; proportions used in sketching.
- Assessment Strategy: Teacher review and uses responses to personalise feedback.
- Diversity adjustments: Includes simplified prompts and a visual scaffold version for EAL/D students.

Resource 2: AI-Enhanced Design Ideation Task

Title: "Ask AI: Expanding Your Concept"

Type: Digital task using ChatGPT (Appendix B)

Bloom's Level: Analysing, Creating.

Syllabus Links: P4.1, H4.2

Description: Students enter a user brief into ChatGPT to generate three alternate product design concepts. They critique AU suggestions and write a comparison analysis.

Annotation:

- Learning Goal: Explore divergent thinking and critique AI-generated ideas.
- Syllabus Alignment: Aligned with H4.2 (communication and evaluation)
- Pedagogical Sequencing: Follows Resource 1, extending ideation through technology.
- HOT Skills: Involves critical analysis, evaluation, and design comparison.
- Literacy/Numeracy/ICT: Uses AI literacy and critical comparison frameworks.
- Assessment Strategy: Formative written response used for feedback.
- Diversity Adjustment: Includes model response samples for students needing structure.

Resource 3: Budget Planning Excel Template

Title: "Design Within Limits: Budgeting Your Project"

Type: Spreadsheet and finance handout (Appendix C)

Bloom's Level: Applying, Evaluating

Syllabus Links: H6.2

Description: Students input their projected MDP material and labour costs into a guided Excel template, calculate totals, and consider cost-saving alternatives.

Annotation:

- Learning Goal: Manage financial limitations within the design process.
- Syllabus Alignment: Directly supports H6.2, addressing cost analysis.
- Pedagogical Sequencing: Positioned after ideation, applying real-world constraints.
- HOT Skills: Students evaluate trade-offs in design decisions.
- Literacy/Numeracy/ICT: Requires accurate data input and spreadsheet use.
- Assessment Strategy: Excel output against rubric.

- Diversity Adjustment: Step-by-step walkthrough video included for visual learners.

Resource 4: Project Evaluation Rubric & Peer Review

Title: "MDP Showcase & Evaluation"

Type: Peer feedback template and rubric (Appendix D)

Bloom's Level: Evaluating

Syllabus Links: H5.1, H6.1

Description: Students present prototypes and receive structured peer feedback using a scaffold rubric focused on functionality, aesthetics, and sustainability.

Annotations:

- Learning Goal: Evaluate design solutions using structured criteria.
- Syllabus Alignment: Supports final evaluation stages of MDP (H5.1).
- Pedagogical Sequencing: Acts as a capstone summative task.
- HOT Skills: Involves reflective evaluation and evidence-based justification.
- Literacy/Numeracy/ICT: Peer review includes structured sentence starters.
- Assessment Strategy: Summative rubric and reflective journal entry.
- Diversity Adjustment: Optional oral reflection mode for students with writing difficulties.

Industrial Technology Timber

Resource 5: Safety Induction Checklist

Title: "Safe Start: Timber Workshop Induction"

Type: Interactive safety checklist and group activity (Appendix E)

Bloom's Level: Understanding

Syllabus Links: P1.2, P3.2

Description: Students participate in a safety walk-through and complete a safety checklist matched with tool identification cards.

Annotation:

- Learning Goal: Identify and describe workshop safety procedures.
- Syllabus Alignment: Aligns with P1.2 regarding safety.
- Pedagogical Sequencing: Essential pre-practical foundation.
- HOT Skills: Encourages analysis of safe vs. unsafe practice scenarios.
- Literacy/Numeracy/ICT: Integrates key technical vocabulary.
- Assessment Strategy: Completion of checklist and Q&A activity.

- Diversity Adjustment: Includes visual cues and bilingual glossary for EAL/D learners.

Resource 6: CNC Pattern Design Challenge

Title: "Make Your Mark: CNC Engraving Task"

Type: Design brief with optional AI support (Appendix F).

Bloom's Level: Creating

Syllabus Links: H3.1, H4.1

Description: Students design a custom engraved panel for a project using software. Extension: use AI tools to generate patterns or refine sketches.

Annotation:

- Learning Goal: Apply digital tools in timber design.
- Syllabus Alignment: Integrates ICT with H3.1 CAD/CAM content.
- Pedagogical Sequencing: Expands on basic workshop skills.
- HOT Skills: Synthesising aesthetics with functional constraints.
- Literacy/Numeracy/ICT: Includes scale and symmetry planning.
- Assessment Strategy: Teacher assesses design file and process log.
- Diversity Adjustment: Templates provided for students needing support.

Resource 7: Joint Measurement Task Sheet

Title: "Measure Twice: Planning Perfect Timber Joints"

Type: Numeracy worksheet (Appendix G)

Bloom's Level: Applying

Syllabus Links: P3.3, H3.2

Description: Students measure and sketch three timber joints to scale, calculate material length, and justify joint choice.

Annotation:

- Learning Goal: Accurately measure and justify timber joinery.
- Syllabus Alignment: Supports production skill development.
- Pedagogical Sequencing: Reinforces theory before practical.
- HOT Skills: Evaluate design suitability of joints.
- Literacy/Numeracy/ICT: Focuses on applied numeracy (mm/cm, angles).
- Assessment Strategy: Worksheet marked and filed in folio.
- Diversity Adjustment: Scaffolded measuring guide for support.

Resource 8: Self-Evaluation Reflection Form

Title: “Craft Reflection: What Did You Learn?”

Type: Self-assessment handout with visual rubric (Appendix H).

Bloom’s Level: Evaluating

Syllabus Links: H6.1

Description: Students reflect on their timber outcomes by rating their process and final product using a guided rubric.

Annotation:

- Learning Goal: Reflect critically on craftmanship and process.
- Syllabus Alignment: Matches summative evaluation stage (H6.1)
- Pedagogical Sequencing: Final task for practical unit.
- HOT Skills: Students use metacognitive skills to self-assess.
- Literacy/Numeracy/ICT: Sentence stems support reflective writing.
- Assessment Strategy: Summative, supports report comments.
- Diversity Adjustment: Visual emoji scale included for accessibility.

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