A FRAMEWORK FOR EFFECTIVE TEACHING AND LEARNING

Vision, Values and Purpose	Professional Learning and Leadership	Procedures, Practices and Strategies

Vision, Values and Purpose

Our Vision

"Inspiring Science Beyond the Classroom"

Our Values

- Respect yourself
- Respect for others
- Respect for the Environment
- Active Participation

Our Purpose

Toohey Forest Environmental Education Centre (TFEEC) provides students with engaging learning opportunities and experiences deeply immersed within the natural and built environments. Students experience connections within the various fields of STEM (Science, Technology, Engineering and Mathematics), including ecology, sustainability, environmental science, robotics, coding and forensic science. To ensure authenticity to real world science, TFEEC partners with a variety of external agencies to provide learning opportunities relevant to school-aged students, undergraduate Griffith University students and teachers.

Programs, and the individual activities that they are comprised of, address the requirements of the _Australian Curriculum_ and _Queensland Senior Syllabus_ documentation. The cross curricular priority of _Sustainability_ and the General Capabilities of _Critical and Creative Thinking_ and _Ethical Understanding_, receive particular emphasis. TFEEC uses a variety of **contemporary ICT's (ES=0.47[1]),** utilised within industry, to create an authentic experience, and enhance the learning outcomes of students that visit the Centre.

Activities undertaken by students can be difficult to replicate in traditional school environments. This is due to geographic limitations (i.e. limited access to natural environments) and / or the requirement for specific knowledge, equipment and skills.

Scientifically literate citizens:

- Are interested in the world around them
- Identify questions, investigate and draw evidence-based conclusions
- Reflect critically on information, data or the claims made by others
- Make informed personal decisions and choices

Professional Learning and Leadership

TFEEC teachers utilise specialist content knowledge and pedagogical skills to deliver high-quality evidence-based educational programs. The quality of the pedagogical practices, and how they are monitored, is evidenced in the findings of the centre's 2018-2020 Annual Headline Indicator Reports where the visiting teachers consistently responded to all elements of the centre's practice at >5.7, well above the highest threshold of 5.5 (6-point Leichardt Scale)

Feedback (ES=0.73)

- The visiting teacher feedback survey enables centre staff to reflect on their teaching, the needs of the students and potential program deficiencies/improvements.
- Internal review of programs and delivery by teaching staff through the Collaborative Teaching and Learning Team approach

Consultation

- New programs are developed and trialled in consultation with a range of stakeholders including centre teachers, visiting teachers and select representatives from external organisations.
- Formal collaborative processes to review program effectiveness in terms of resources and pedagogical practice.

Professional Development

- All staff at TFEEC participate in professional development that aligns to their Personal Development Plans and the Key Priorities of the Annual Implementation Plan (AIP).
- Group sharing of the learning from professional development at T&L staff meetings enables staff to reflect on the knowledge and skills obtained by others, and their relevance/potential application to the unique context of the centre.
- The centre is committed to the development of leadership capacity for all staff, being a small school we recognise the need to take on leadership roles and participate in leadership programs.

Professional learning

The centre is committed to the development of knowledge and skills of all teaching staff through the provision of professional learning opportunities targeting pre-identified instructional elements (**Microteaching ES=0.88)** focussed on through the Collaborative Teaching and Learning Team approach. This effectively sees the teaching team meet regularly to discuss program development, implementation / teaching strategies, reflect on individual and collective efficacy etc.

Procedures, Practices and Strategies

Teachers at TFEEC teachers build their teaching and learning practices around a constructivist approach to learning and the use of highly effective, evidence-based T&L strategies. In particular, TFEEC utilises an active learning approach whereby students learn through "doing", building upon existing knowledge and understanding in response to learning opportunities which are largely beyond what is possible in a traditional classroom. This places students at the centre of all teaching and learning practice, and teachers as an activator or facilitator of learning. These approaches "challenge, support and interest students as well as engaging them with authentic and contemporary issues requiring **problem solving (ES=0.68)**"[1].

What does this mean for students?

- Clearly articulated **learning goals (ES=0.68)** relevant to the content descriptors of the Australian Curriculum: Science
- **Classroom discussions (ES=0.82)** which allow students to communicate with one another on their existing knowledge, experiences and foundation thinking skills.
- Provides opportunities to investigate, draw evidence-based conclusions and justify arguments for and against issues
- Encourages them to ask questions, seek answers and critique the claims made by others
- Develops higher-order thinking processes

What does this mean for teachers?

- Program development and learning follow the **_Piagetian program (ES=1.28)_ approach**
- Utilising activities or investigations that provide for active (i.e. 'doing') rather than traditional passive learning opportunities (inspire, model, practice, apply, connect and transform)
- Employing **questioning techniques (ES=0.48)** beyond recall or descriptive skills following Eric Frangenheim's Thinking Skills Framework and encourage more sophisticated, evidence based, evaluative thinking
- Using 'real life' contexts and narratives that are relevant to the lives, interests and future applications of students to provide a **deep motivation and approach (ES=0.69)** to the program
- New teaching staff are inducted into the centre's environment utilising a 'I do; We do; You do' approach or gradual release of responsibility model. While this is time consuming, the approach does provide for quality assurance, and ensures that the transition is well supported.

[1] ES refers to Effect Size as detailed in Hattie, John, 2013, _Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement._ Routledge

6 Principles	Evidence and Practice
1. Student-centred planning	The unique context of TFEEC has enabled the development of a school ethos that focusses on student learning rather than simply attainment and as such fosters a greater enjoyment and ownership of their learning. Teaching staff ensure student-centred planning by: • Quickly establishing a positive *teacher-student relationship (ES=0.52)* with students to enable formative assessment of individual needs and to determine student progress, in addition to feedback provided from visiting teachers regarding requirements for individual or group differentiation. • Identifying and articulating clear links to select content descriptors of the Australian Curriculum (for teachers) and explicit learning goals (for students) during initial stages of the program to motivate students to become active participants in the learning process. • Developing programs around a relevant, meaningful context such as clearly-articulated, engaging narratives (e.g. Teacher-in-role) at the concrete operational stage of development or a more authentic, industry-based contexts at the formal operational stage of development (e.g. Bio-condition reports) • Creating strategies embedded within programs to engage students in *collaborative tasks (ES=0.34)* that require students to interact with peers in a variety of ways including small to mediums sized groups to large groups requiring a high level of collaboration at the formal operational stage of development to successfully complete tasks • Utilising formative assessment techniques (e.g. observations, questioning, teacher led discussion, peer / self-assessments) to determine student progress and provide feedback on student learning throughout the program
2. High Expectations	Students are presented with *challenging learning goals (ES=0.59)* and *problem-based scenarios (ES=0.68)* that require the application of higher order thinking skills. This is achieved by: • Providing learning opportunities that scaffold tasks to enable students to activate prior knowledge and integrate it with new knowledge to reconstruct misconceptions and deepen their knowledge and understanding of environmental issues • Developing higher order thinking skills by creating tasks that allow students to analyse, evaluate, justify and/or create using knowledge and understanding build upon during early stages of programs • Use of digital technologies (ICT's) to enhance student learning where appropriate by enabling a greater scope of learning through improved time management and collaboration • High expectations are evident in the Annual Improvement Plan (AIP), particularly Teaching and Learning and Human Resource initiatives. Staff maintain a high level of proficiency relevant to the unique setting through professional development across a range of areas including content knowledge, pedagogical skills, the Australian Curriculum, incorporating ATSI culture and the application of ICTs to value add to the learning environment.
3. Alignment of curriculum and pedagogy	• Program documentation uses a consistent format to clearly articulate the *Australian Curriculum* content descriptors and related student learning goals addressed in individual programs. • To assist visiting teachers with program selection, planning and reporting, the documentation is freely available on the Toohey Forest Environmental Education Centre website in both html and downloadable PDF formats. • The majority of programs are accompanied by a detailed student field booklet to guide and support student learning. These booklets are suitably scaffolded and developed to align with school-based units of work aligned with the Australian Curriculum standards. Field booklets are developed to provide students with an increasing level of task complexity following Eric Frangenheim's Thinking Skills Framework. • Client schools have the option of utilising the student field booklet as an assessment (formative or summative) piece. • Visiting teacher feedback and internal peer mentoring serve as a measure of quality assurance to ensure programs meet the expectations and educational needs of participating students.

4. Evidence-based decision making	TFEEC uses narrow, evidence-based decision making to enhance its program development and delivery by making small, incremental changes to its pedagogical practice that are both measurable and targeted. Centre staff use evidence gathered from a variety of contexts to inform their practice. Teaching staff at the centre engage in a continuous cycle of improvement. Data is used to provide teachers with feedback, including: • Peer review processes following the centre's CMP to identify and target instructional elements (ASoT) of their teaching practice and accessing professional development opportunities that are focused on the 'how to teach' (as opposed to 'what to teach') • Feedback derived from the visiting teacher online survey which is analysed at the end of each term. The centre constructs targeted questions within the survey that are narrow and explicit and allow staff to focus on specific pedagogical practices identified within the Annual Implementation Plan as areas for potential improvement. • Team teaching as a means of 'de-privatising' classroom practices • Visits to select outdoor and environmental education centres, or other similar outreach education providers (Queensland Museum, CSIRO, tertiary education providers), to view best practice Teaching strategies employed by centre teachers are also reviewed to determine their effect / influence on student learning. Given that centre teachers have only a very short term exposure to students, it is essential that programs and teaching strategies are student focused and designed to maximise the impacts on participating students learning. Centre staff do this by: • Aligning pedagogical practices to those that have an influence above the effect size hinge point of 0.4 according to John Hattie's Visible Learning model • Aligning pedagogical practices with recognised educational research through professional sharing / discussion at staff meetings • Recognising pedagogical practices utilised by select O&EEC's, mainstream schools and educational outreach providers as best practice and adopting those practices where applicable to our context.
5. Targeted and scaffolded instruction	Students undertake activities / programs with a varying level of knowledge and skill development. Consequently, centre teachers are constantly required to draw upon a range of teaching strategies to meet the educational needs of students. This is achieved by: • Breaking down concepts into manageable steps (*Scaffolding (ES=0.82)*) and monitoring student learning using *formative evaluation (ES = 0.48)* techniques. Scaffolding tasks allows centre staff to tailor challenges according to the current ability if students and provide rich feedback that actively helps students develop a deeper understanding of • Utilising a variety of teaching strategies to appeal to a diversity of learners (e.g. auditory, visual, tactile-kinaesthetic stimuli) • Selecting and adapting resources to ensure all students have an opportunity to achieve learning goals • Incorporating a mixture of individual, flexible groupings (i.e. cooperative learning) and whole class discussions • Modification of teaching (language, tone, pace, positioning, student-teacher ratio)
6. Safe, supportive and inclusive learning environments	Staff are dedicated to providing a safe, supportive and inclusive learning environment to meet the educational needs of learners. This is achieved by: • Applying a consistent approach to student management that advocates that all students demonstrate "RESPECT for self, others and place" (i.e. the physical environment) • Creating an innovative, engaging and interactive learning environment that enables students to actively participate in learning through 'hands on' experiences • Valuing diversity and prior learning (i.e. constructivism) when planning and delivering programs • Centre staff undertaking an annual review of Curriculum Activity Risk Assessments (CARA's) and WH&S incident / accident reports • All staff complete mandatory all staff training (MAST), and other additional professional learning as required (e.g. senior first aid)