

Australia (Victoria)

John Monash Science School

This school is a newly founded specialist secondary school (students aged 15-18) devoted to the teaching of mathematics and sciences to selected high-achieving students. The school is located on the Clayton campus of Monash University, and cooperates with university staff for cutting edge research-inspired curriculum development, weekly co-curricular activities, and to give students access to university enhancement subjects. Students are almost exclusively taught in large groups with several teachers, and supported in small tutor groups and via close monitoring of student performance. The physical environment can be flexibly configured, and allows ready access in many ICT resources. All students have an individual tablet computer which is used as chief learning tool, and for electronic (partly one-on-one) communication between students and staff. Emphasis is placed on professional learning and staff development.

Main focus of innovation: LEARNERS, TEACHERS, CONTENT, RESOURCES, ORGANISATION

Other keywords: learningspace, technology-rich

General Information

Name of the ILE: Team Teaching and Effective Learning in the Senior Years of Schooling

Location/Address: Building 84, Monash University, Wellington Road, Clayton 3800

Website: www.jmss.vic.edu.au

ILE submitted by: John Monash Science School

Rationale

Why do you suggest that it should be included in the project? How does it respond to 21st century learning challenges?

We at John Monash would love to be involved in this project! Our learning environment is innovative and caters for the needs of 21st century students in flexible spaces utilising ubiquitous ICT. Nowhere in the school are there spaces that reflect the traditional “industrial model” of classroom teaching. This project also comes at an opportune time for us as we develop strategies, structures and an effective teaching and learning model that will allow us to use these innovative spaces to maximise learning outcomes for all of our students.

Learning Aims / Intended Learning Outcomes of the ILE

What are the core learning aims and which knowledge, skills or attitudes are to be acquired? (These may include outcomes related to learners’ social, interpersonal, or meta-cognitive development)

In addition to the explicit aims above, the school is expected to develop methodologies and programs which can inform the teaching and learning of Science, Mathematics and associated technologies for senior secondary students as we move into the 21st century.

Within our new learning environment we also plan to:

- Foster and sustain co-operation via outreach involving over 1000 schools across Victoria through the proposed Associate Schools Network;
- Push the boundaries within current curriculum offering in senior science;
- Add a rich mix of new studies to cater for a wide variety of specialties and interests within the broad scope of science;
- Better reflect the ways in which contemporary scientists know and undertake their work via the opportunities we provide for students.

Learners

Which group(s) of learners is it aiming at? Who is eligible to take part? How many learners are there? What are their ages?

At full capacity our school will comprise approximately 660 students mostly aged between 15 and 18 years. Currently in our first year 2010 we have 191 students. This project would involve all students due to the nature of this school.

Our students have been selected via a stringent admission process that tests for potential and aptitude in Mathematics and English and capacity and interest in Science. Most applicants are also interviewed to further clarify scientific passion and interest.

Facilitators

Who are the teachers/facilitators? Who are the leaders? What are their professional backgrounds? What are their roles?

JMSS is fortunate to have PCOs and Leading Teachers who have played key roles in successful Leading Schools projects in other settings. The JMSS project will be led by Peter Corkill and Andrew Chisholm. Peter was formerly Principal of Cheltenham Secondary College and he was one of those responsible for the creation of the Year 8 Learning Futures program which created an innovative integrated approach to the teaching of science and humanities in a large flexible learning space.

The LSF program has won the plaudits of the Innovation and Next Practice Division for its positive impact on the learning of students and the learning culture at the college. Andrew was formerly Assistant Principal at McKinnon Secondary College and was the facilitator of the LSF project that created the new Year 9 BYTES program in the purpose-built technology-rich McKinnon Research and Exploration Centre (MERC). This too was featured in DEECD publications as an exemplar program in innovation in learning and teaching.

Sally Cheah-Johnson, the second Assistant Principal, played a key role in the Yarra Valley eLearning cluster, a successful LSF program involving six large secondary schools. Our five leading teachers all come from schools with innovative middle years learning programs such as Balwyn High School, Mentone Girls, Berwick, McKinnon and Cheltenham Secondary Colleges.

The mix within the leadership group has already created a dynamic and talented team that has started to develop an exciting range of pedagogies and learning experiences for our students.

Organization of the ILE

How is learning organised? How do learners and facilitators interact? What kind of pedagogy do they follow? What curriculum is used?

All classes in all subjects are held within this innovative learning environment. Spaces are flexible and can be configured according to the learning needs of the students and the pedagogies chosen for each particular activity by our teachers. Having one to one tablet use with high-speed wireless adds to the flexibility of these spaces and the range of activities our students can undertake.

Regular access to other technologies such as mobile interactive whiteboards and mobile video-conferencing also assists in improving student engagement and widens the possible range of learning opportunities for our students.

All Year 10 students complete subjects from the each of the following domains: English, Maths, Science, Enrichment Science, Issues Studies, Creative Studies, Physical Education and Personal Learning and Wellbeing. There are several choices within each domain, for example Enrichment Science contains nine options for students, each co-written by JMSS staff and University academics and each enabling students to access cutting edge scientific knowledge and research. Creative Studies investigates robotics, virtual landscapes, algorithmic thinking etc whilst Issues Studies investigates the interface between the humanities, for example geography, philosophy, history, economics, etc., and the sciences, around some of the biggest issues facing contemporary researchers.

Some students are accelerating up to two years above their age and all students access their own individual learning program. It is envisaged many students at this school will access university enhancement subjects whilst doing traditional year 12 subjects.

Learning Context

In which context does learning take place? What does the physical learning environment look like? Are community resources used to facilitate learning and how?

The physical environment is very different from traditional learning environments. There are virtually no walls between learning spaces with students able to learn in ways that best suit their own needs. All students create and implement learning plans that are individualised and are informed by their own interests and abilities. Students use tablets as their chief learning tool, to research, problem solve, organise, document, analyse, present and create digital objects as well as accessing references and resources from the University and beyond.

As we continue to learn and to grow, our ideal learning environment will have students working on a range of tasks at different paces. These students could be working in groups or individually, and each student will have a mentor/coach with whom he or she could communicate about the work being completed.

Our school has neither bells nor loudspeaker announcements and all communication is via electronic bulletins, wiki spaces and email. Students and staff are also using Google Apps to communicate, share work, create learning sites and share calendars.

History of ILE

Who initiated it? For what reasons was it started and with what purpose? Have these changed since?

The JMSS dream was realised in 2010 after several years in conception and planning. Three professors from Monash University first proposed the idea of having a specialist school devoted to the teaching of the sciences in 2002. The design of the building resulted from collaboration between DECCD, Monash University and the specially chosen architects, Taylor-Oppenheim.

The location of our building is within the STRIP (Science Technology Innovation and Research Precinct), a series of buildings that house research into the latest developments in Science such as stem-cell science and nanotechnology.

The objectives of JMSS are to:

- increase student interest in and enthusiasm for science, mathematics and technology;
- improve student learning outcomes in these areas across the state;
- encourage high levels of student achievement for students enrolled at the school;
- enhance teacher skills, knowledge and credentials in science, mathematics and technology education; and
- improve teaching and learning practices in these areas.

Funding of the ILE

How is it funded?

This learning environment and the equipment within it have been funded entirely by the Victorian Government, in collaboration with Monash University. The University has released nine researchers and lecturers from their normal tasks to work with our teachers to design curriculum and learning experiences for our students. Other University staff have helped develop the ICT solution to ensure all students have a seamless coverage from our school onto the university campus, and designed the network solution to ensure digital resources can be shared between our school and the university. They have also allowed us to use much of their current research on flexible learning environments to create such an innovative learning environment for our students.

Learning Outcomes

What are the learning outcomes achieved by the ILE, including academic, social, interpersonal and meta-cognitive outcomes? How is learning assessed?

Data collection to assess the impact of programs at JMSS is very much in its infancy. We will be creating a range of measures to assist us in evaluating the effectiveness of our programs as we become established. This will span a number of areas including academic achievement, connectedness to school, teachers and peers as well as student and teacher reflections about how they think we are progressing and succeeding in this unique venture.

All staff have to complete an individual SDP (Staff Development Plan) that includes sections related to identifying suitable professional learning opportunities for them that are related to the strategic directions of the school. Professional learning is seen as key to our success and every teacher is able to access three hours of professional learning and curriculum development each Wednesday afternoon, whilst the student cohort undertakes a range of co-curricular options delivered by educators from within and outside the university. It too is a unique model of provision which has major benefits for both staff and students.