ONE SIZE DOES NOT FIT ALL: A CASE FOR DIFFERENT LEARNING PROGRAMS

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ABSTRACT

For the first time since formally commencing operations on 1 July 2010, Unitywater will operate and maintain all 17 STPs (sewage treatment plants). The 'Transition Project' was planned to ensure a smooth and seamless changeover from Contractor to Unitywater staff for operation and maintenance of the Noosa STP and the Redcliffe STP.

One of the critical success factors of the project was implementing a fit-for-purpose training program for the operations and maintenance teams, tailored for different learning styles. With the support and feedback of the operators, the program was structured to consist of theoretical training, on-site training followed by a comprehensive shadowing period for three months prior to handback. This included collaborative engagement with the existing Contractors and the use of wearable technology (Hindsite) by our Operators.

The training program started at both sites with a tour of each plant with the Contractor and operations leadership. This was followed either by online training using videos, visuals, drawings and comprehension tests or by virtual workshops facilitated by the Contractor plant manager and Contractor process engineer. The online training courses allowed operators to conduct training at their own pace, and the virtual workshops facilitated real-time questions, although recordings of these workshops were available for review after.

On-site operations training started with hands-off shadowing, whereby a Unitywater operator would follow a Contractor operator for the day. Once suitably familiar with the rhythm and routine, the Unitywater operators were assigned tasks done under supervision, and eventually tasks done independently with Contractor operators available for assistance, if needed.

Training intensified as the Transition Project shifted in the Organisational/Operational Readiness phase (3 months to handback). Throughout the course of this training program, we found that one size does not fit all operators, with multiple approaches and tweaks needed for our learning journey.

1.0 INTRODUCTION

Unitywater provides safe, high-quality and reliable water and sewerage services to the Moreton Bay, Sunshine Coast and Noosa communities. Of the 17 STPs across these regions until 2022, Unitywater operated and maintained 15 of these plants. The Noosa STP was operated by Suez and the Redcliffe STP by TRILITY, for Unitywater via design-build-operate-maintain (DBOM) contracts, with a common expiry date for their initial terms on 30 November 2022. The Transition Project aimed for the smooth and seamless transition of operations and maintenance of Noosa STP and Redcliffe STP to Unitywater. The management of change throughout this entire process across the multiple stakeholders was a critical success factor for this project, along with the training program for Unitywater operations and maintenance teams in the lead-up to handback.

The goals of the Transition Project were to:

1. Ensure a smooth and seamless transition of operations and maintenance to Unitywater.
2. Identify risks to compliance with the Environmental Authority and assist stakeholders to scope, plan and execute activities to identify these key risks, including upgrades, replacements and renewals.
3. Engage in a fair contractual process between all parties, and
4. Maintain positive relationships with the contractors.

The focus of this paper is on the smooth and seamless transition of operations and maintenance to Unitywater, specifically with the knowledge transfer from the contractor teams to the Unitywater teams.

2.0 DISCUSSION

It was essential from the project kickoff to understand the value of working collaboratively with the Contractors to ensure project objectives were met, specifically the learning and development goals of the operations and maintenance teams for a smooth and seamless transition.

Key to this was being considerate about the impact of changes to the Unitywater teams inheriting new-to-them plants, and also the impact of changes to Contractor staff, noting that some had served on the plants for 25 years and it was a significant shift for them professionally and personally to demobilise from the plants. Knowledge transfer from the contractor operator to the Unitywater operator was critically essential.

Early stakeholder engagement confirmed the importance of training for operations and maintenance, change management and communication across the entire business. A rolling audit program was developed to ‘leave no stone unturned’ with a focus on key risk areas such as technology (human-machine interface (HMI), supervisory control and data acquisition (SCADA), programmable logic controllers (PLCs), quality, environmental compliance, recycled water quality and facilities.

Unitywater identified structural changes to their operations teams were needed to accommodate the addition of these two treatment plants. This was required to ensure that the balance of process complexity and work requirements were comparable between all cells across the entire region. Operators were encouraged to voice concerns about the changes in regular engagement sessions with the cells impacted by the Transition Project. Internal staff (Process Engineer, Maintenance Planner) were seconded to the project to facilitate maintaining corporate knowledge of the treatment plants.

It was essential from the project kickoff to understand the value of working collaboratively with the contractors to ensure project objectives were met. Key to this was being considerate about the impact of changes to the Unitywater teams inheriting new-to-them plants, and also the impact of changes to contractor staff, noting that some had served on the plants for 25 years and it was a significant shift for them professionally and personally to demobilise from the plants.

The initial decision to ensure embed fair and reasonable contractual processes (objective #3) and maintaining positive relationships with the contractor (objective #4) drove positive behaviour under the banner of the Transition Project. It is worth noting that the two contracts and contractors were very different, however, the approach from Unitywater was consistent. Due to the age of the Noosa STP, additional engineering was required to prepare Unitywater for handback and future planning, specifically a process capacity assessment and an operations and maintenance review to identify risks and

additional resourcing required to manage environmental compliance upon handback.

Unitywater provided leadership and direction with the development of operations and maintenance training programs. With the support and feedback of the operators who would be undertaking the training, the program was structured to consist of theoretical training, on-site training followed by a comprehensive shadowing period for three months prior to handback. Maintenance training was targeted to focus on equipment unique to the plants, with shadowing occurring for specific maintenance activities such as screens inspection and pump de-ragging.

2.1 Learning as an Adult

In developing the training program for the Transition Project, it was important to understand the learning and development journey for an adult. Adult learning theory is based on five assumptions, shown in Figure 1. The first assumption is that adults are self-directed; they are independent, want to manage their own learning and need to find their own way. The second assumption is that they have experiences they can apply to their learning journey; they may have some ingrained ideas and use problem-solving and critical reflection when taking in new information. The third assumption is readiness; that adults want to learn things that are relevant to their context; they want just-in-time learning and need a "why" and "what" for learning goals. The fourth assumption is that adults are engaged in learning that is problem-centred and practical; the best learning for adults is practical, applicable and useful. The fifth and last assumption is motivation; adults are motivated by various drivers including job satisfaction, self-esteem, personal and professional growth and development.

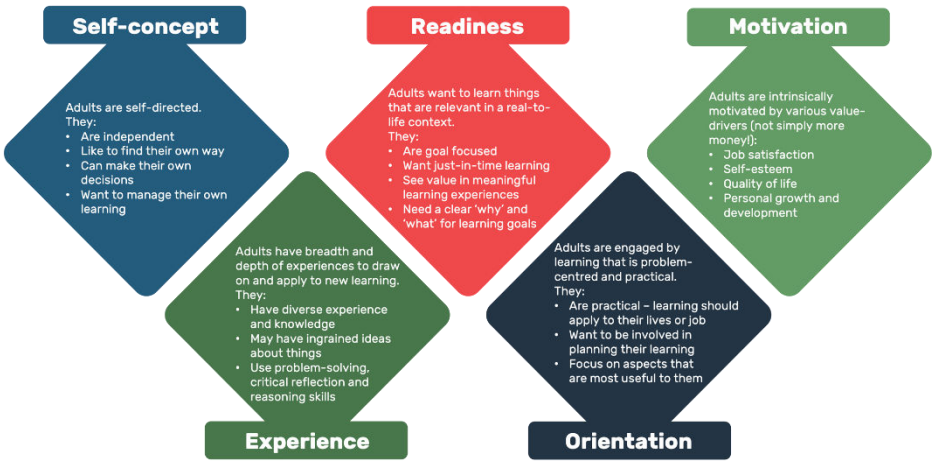

Figure 1: ***Adult Learning: The Art and Science. Sourced from The Instructional Design Australia (2023) and M. Knowledges (1984).***

2.2 Training Development

Given the context of adult learning and the importance of a fit-for-purpose training program that catered to each person from the operations and maintenance teams, a schedule and plan was developed and tailored for different learning styles and paces. With the support and feedback of the operators, the program was structured to consist of theoretical training, on-site training followed by a comprehensive shadowing period for three months prior to handback. This included collaborative engagement with the existing Contractors and the use of wearable technology (Hindsite) by our Operators.

The training program started at both sites with a tour of each plant with the Contractor and operations leadership. This was followed either by online training using videos, visuals, drawings and comprehension tests or by virtual workshops facilitated by the Contractor plant manager and Contractor process engineer. The online training courses allowed operators to conduct training at their own pace and were incredibly well received. The virtual workshops facilitated real-time questions, although recordings of these workshops were available for review after.

On-site operations training started with hands-off shadowing, whereby a Unitywater operator would follow a Contractor operator for the day. Once suitably familiar with the rhythm and routine, the Unitywater operators were assigned tasks done under supervision, and eventually tasks done independently with Contractor operators available for assistance, if needed.

Training intensified as the Transition Project shifted in the Organisational/Operational Readiness phase (3 months to handback).

2.3 Hindsite and the Use of Wearable Technology

The use of wearable technology for recording and capturing routine and non-routine operational and maintenance activities was trialled as part of the Transition Project. During the shadowing phase, operators and maintainers had the ability to wear either a hands-free, voice-activated headset video recorder, or use their mobile device to capture critical information required to operate each STP.

All content was directly uploaded to Hindsite web-based portal where it was named with a brief description, geographically tagged, and stored in appropriate digital workplaces. This content could be recalled both back in the field and from any personal computer or mobile device, which could be used for training and support material in the early operations phase upon handback.

One of the challenges of the Transition Project was the operation team responsible for operating the STPs upon handback (seven Operators and one Treatment Plant Coordinator), also had to operate the three other STPs in their "Cell" while the Transiiton Project was underway. This meant that not all operators had the ability to spend much time onsite during the shadowing phase. As there were only between six and three months to transfer as much information as possible over, Hindsite was an efficient way to capture this information, facilitate familiarisation with the routine and rhythm of day-to-day operations and make it available to the operators that could not be onsite on the day of the training event.

As the training program ramped up, unfortunately so too did COVID restrictions. Operators serve as critically essential personnel, and to manage the risk of workplace health and safety and ensure continuous operation of Unitywater's STPs without sacrificing the learning and development program for the Transition Project, the decision was made to stand up Hindsite to facilitate remote learning. In hindsight (no pun intended), a longer lead-in and operator engagement should have taken place to facilitate uptake of this learning opportunity. A significant amount of change was already taking place and the uptake of a brand-new product and technology during the Transition Project was limited. For future integration with operations learning and development, due consideration should be given to the diversity of demographics and openness to new technologies. Uptake was reasonably high for those who were used to trialling new technology and incorporating that in their learning and development.

3.0 CONCLUSION

In summary, what worked well during this learning and development program included:

- The hands-on shadowing phase was the most effective learning phase based on operations and maintenance feedback.
- Dedicated resources to manage this project and ensure quality outcomes helped facilitate the learning journey. This was specifically true for having a process engineer dedicated to the project who was able to assist and complement the learning material whilst learning it themselves.
- All stakeholders involved from Unitywater and both Contractors were genuinely motivated for a successful outcome.
- Transferring employment of some of the contractor staff over to Unitywater after handback and keeping a subject matter expert on for a period post transition as a "dial a friend" option assisted with the seamless transition.

Some challenges included:

- Change management fatigue for the operations team: the operations team underwent a significant amount of change in a short period of time, from a structural change to learning a new process while maintaining business as usual with their other STPs.
- The change in business model from an operator/maintainer-run plant back to separate operations and maintenance business model required a significant amount of effort to unpack and then ensure all risks were addressed in the transition.
- Transferring all the STP knowledge over to operations and maintenance in a compressed period of time (approximately six months, realistically three months). There are a lot of idiosyncrasies within STPs which can take years to learn, a lot of these were picked up in the Transition Project, but not all of them. There continues to be learning opportunities post handback, which is reflective of the general water industry experience operating and maintaining STPs.

It is important to note that a variety of learning options suit a diverse range of adult learners. Providing opportunities to for operations and maintenance staff to "self-serve" along their learning journey so they can manage their own learning is important. It's also essential to be able to apply the practical learning content as soon as possible, which is essential for learning hands-on tasks such as formic acid cleans on diffusers.

Throughout the course of this training program, we found that one size does not fit all operators, with multiple approaches and tweaks needed for our learning journey. The feedback for the online training modules was overwhelmingly positive due to the quality, specificity and amount of detail and accompanying resources (standard operator procedures, unit process guidelines, online training modules). The hands-on operator shadowing was also well received but was highly dependent on the motivation, knowledge and communication skills of the Contractor operator and the experience, curiosity and willingness to learn of the Unitywater operator.

4.0 ACKNOWLEDGEMENTS

We would like to sincerely thank every operator and trade who participated in this program, from Suez, TRILITY and Unitywater. We appreciate the trust they placed in us to develop and roll out a program that was essential to the successful delivery of their duties as front-line stewards of public health, safety and environment. Without the

unreserved support for learning and development from the management and executive team at Unitywater, undertaking a program of this type would not have been possible.

5.0 REFERENCES

Adult Learning: The Art and Science. Sourced from the Instructional Design Australia (2023) and M. Knowledges (1984).