engineering new zealand
te ao rangahau

CRITICAL REFLECTION

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INTRODUCTION

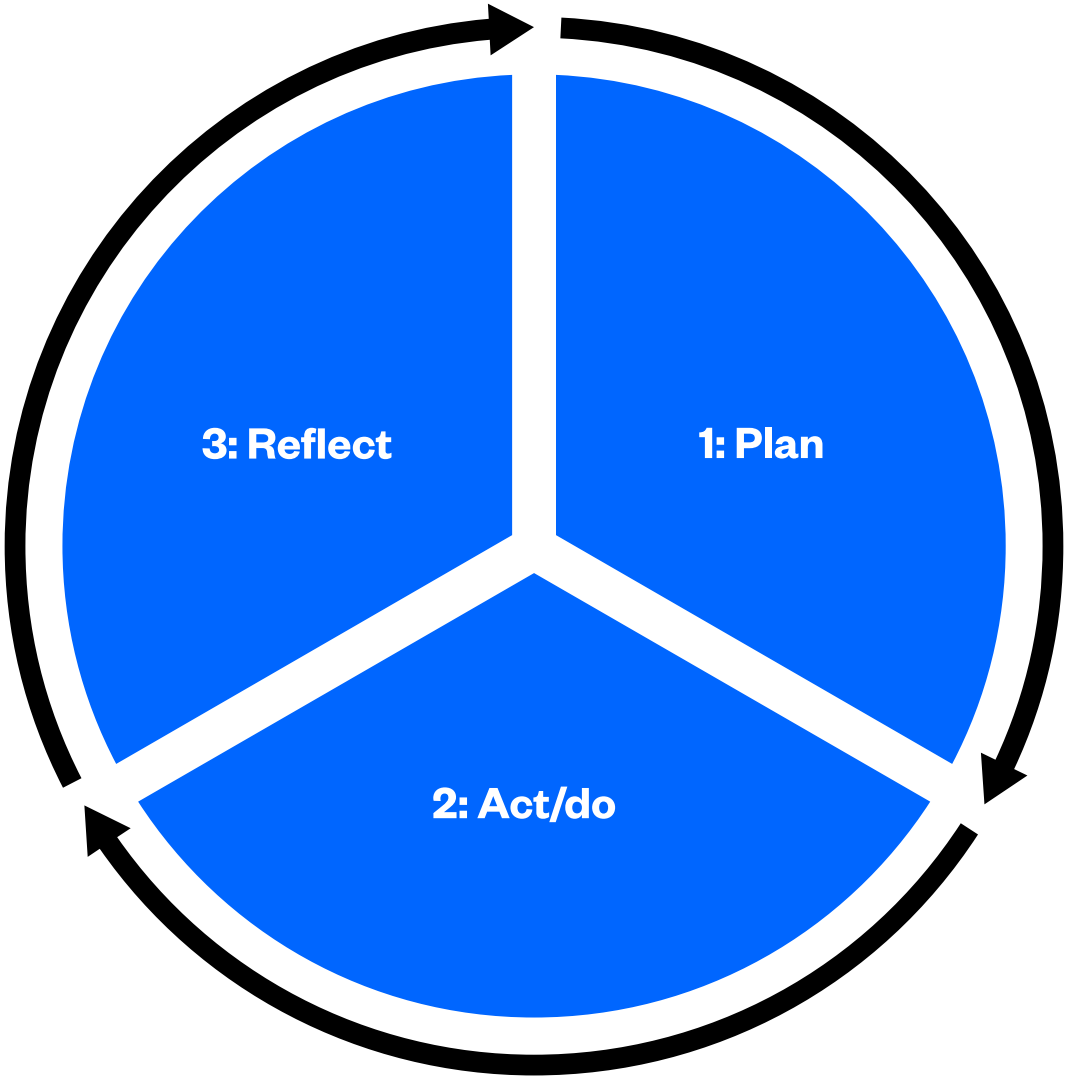
Critical reflection is a technique used to actively reflect on your past actions, behaviours, or experiences, to plan and improve your competencies and performance. It's also used in systems like Six Sigma[1] to continuously improve performance and outcomes.

Critical reflection is also known by names such as action learning and continual improvement and is characterised by an ongoing cycle of three steps (1: Plan, 2: Act/Do, 3: Reflect) as follows.

1. Plan – what areas are you going to develop or improve, and how?
2. Act/Do – what will you do to practice and develop that ability or skills?
3. Reflect – how did it go?
    - What went well (your strengths)?
    - What didn't go so well?
    - What areas are you going to keep working on to improve?

Critical Reflection also recognises that much of your learning and development happens on the job, supported by those you work with.

Figure 1: The critical reflection learning cycle



[1] en.wikipedia.org/wiki/Six_Sigma

WHY THE PROCESS IS IMPORTANT

Critical reflection enables you to build competencies and capabilities (skills, knowledge, and attributes) in a deliberate and structured approach and benefits everyone you work with – organisations, projects/ teams and individuals – to improve performance and outcomes. You need to understand the bounds of your competence and where you want to grow your knowledge to improve. Read through the Bounds of Competence article[2] for more information.

The practice of Critical Reflection benefits organisations, projects/teams and individuals as shown in Table 1.

Table 1: Benefits of critical reflection

LEVEL	BENEFITS
Organisation	• Organisations are seen as taking responsibility for matching abilities and skills against the competencies required for roles. • In-house expertise and experience can be used in a targeted way to help others grow and develop professionally, with coaching and mentoring (and regular conversations and feedback).
Project/team	• Project teams are an excellent opportunity to support on-the-job learning with practical activities in the workflow, such as problem-solving, and to observe others in action and learn from them.
Individual	• Individuals can grow professionally in a planned and considered way and are consciously competent. • Applying critical reflection and documenting progress can contribute to CPD (to show continual learning and development).

WORKING WITH MENTORS AND COACHES

Critical reflection works best when you drive your development and growth. It also recognises the role of coaches and mentors to help you upskill and embed new knowledge and skills on the job.

Your role

- Keep a record of your competence, areas to develop, and your continuing professional development (CPD). If you're a member of Engineering New Zealand, you can log your CPD hours and work records in the online member area.
- Identify the overall competencies[2] you want to work on (and break these into smaller, achievable, and measurable steps).
- Discuss this with others who are supporting you (such as with supervision, coaching and specialist knowledge).
- Document courses you attended and engaged with, showing how you have been an active participant and are making changes to enhance your performance. For example, provide examples of where you have used the information gained in your day-to-day work, or a specific project.
- Record actions you have taken from conversations and feedback from others.

Tips for mentors and coaches

- Ensure you understand their focus for competency development.
- Offer suggestions on courses, readings and research, practical activities, and specialists to engage with.
- Suggest practice activities, for example, specific project work under the supervision of an expert.
- Provide feedback and coaching opportunities.
- Support them to develop their knowledge in measuring progress in their development.
- Be positive – encourage effort and grit and recognise achievement.
- Remember: it is not the role of the mentor to be the expert, it is to guide the mentee.

[2] www.engineeringnz.org/documents/1063/Bounds_of_competence.pdf

Example 1 – APPLYING THE CRITICAL REFLECTION CYCLE

Table 2 shows an example of how to apply the cycle, for developing the knowledge and skills around 'writing project specifications'.

Table 2: Example 1 – applying the cycle

STEP	FOCUS	EXAMPLE: WRITING PROJECT SPECIFICATIONS
1: Plan	• Identify what competency you will focus on. This is often aligned to your career, role, firm, or trends. • Write a specific goal based on this competency. • Break it into small achievable steps. • Ask 'How will I know when I achieve my goal?' (What does success look like?) • Identify what support and resources will help you. Line these up by yourself or approach your manager for additional resources. **Tip:** Don't over-commit yourself. Look at the amount of time you have available and plan realistically. You learn most effectively with spaced repetition.	**Competency:** developing project specification documentation. **Goal:** Learn to develop documentation for a simple project. This means: • Applying correct template and guidelines • Gathering correct information (such as subcontractors, and material specs) • Writing content and check against costing • Getting document reviewed and approved • Managing files and communication • Reporting on progress • Escalating any issue to your manager **Support required could include:** • Templates, exemplars, guidelines, policies • Senior engineer (content) admin (process), manager (mentor, final review and sign off).
2: Act	• Do what you said you would do. • Use the resources around you to learn and get feedback. • Remember most learning occurs on the job from experience. • Use opportunities to observe and learn from others in action.	I completed the project specification document for the project, followed my plan, and had my manager review, mentor and guide throughout.
3: Reflect	• Seek feedback from a wide range of sources. • What went well? • What didn't go so well? • What areas are you going to keep working on to improve?	• I met the required standard of my organisation and timeframes. • I will repeat the exercise for another simple project (and be more independent) and will observe the process for larger more complex projects and activities. • I need to apply rigorous project management procedures such as PRINCE2 for future projects.

Example 2 – planning, action, and reflection

Table 3 provides an example of using the template to guide your planning, action, and reflection, for competency on 'awareness and use of technical documentation'.

Table 3: Example 2 – planning, action and reflection

STEP	DETAIL
1: Plan • Identify overall competency and specific goals based on this competency. • Break it into small achievable steps. • How will you know when you achieve your goal? Define your acceptance criteria. • Identify the support and resources you need.	**Competency:** Awareness and use of key technical documentation, guidance, and standards (www.sesoc.org.nz/library/other-publications/body-of-knowledge/) **Goal:** Demonstrate general knowledge of the New Zealand Building Act, the New Zealand Building Code, its core cited design actions and materials standards, and other important guidelines and standards **Achievable step:** Get up to date on current seismic assessment standards and guidelines. **Measures of success:** • Review NZSEE "Red Book" The Seismic Assessment of Existing Buildings • Review HERA & SCNZ Design Guidance, Cement & Concrete Association Design Guidance (including Red Book examples and Concrete Floor and Pavement Design) • Ask a senior engineer to talk through how they carry out seismic assessments • Attend a seminar/workshop on seismic assessments • Review five recently completed seismic assessments and talk to the relevant lead engineers about them. Ask them what approach they used and the lessons they learned from those projects. Ask yourself if that's the way you would have approached the projects. If not, why not?
2: Act • List the actions you took.	Reviewed relevant guidelines and standards identified, plus refreshed knowledge of NZS3101 Concrete Structures and NZS3404 Steel Structures to update myself on how they are aligned. Learnt how the guidelines were applied in a range of buildings. Learnings are: .....
3: Reflect • Seek feedback from a wide range of sources. • What went well? Identify positive achievements. • What didn't go so well? Identify potential for improvement. • What areas are you going to keep working on to improve?	

TEMPLATE

Table 4 provides a template you can use for critical reflection of your own practice.

Table 4: Critical reflection template

STEP	DETAIL
1: Plan • Identify overall competency, and specific goal based on this competency. • Break it into small achievable steps. • How will you know when you achieve your goal? (measures) • What support and resources do you need?	
2: Act/Do • Document what you did.	
3: Reflect • Seek feedback from a wide range of sources. • What went well? • What didn't go so well? • What areas are you going to keep working on to improve?	

Engineering New Zealand Te Ao Rangahau
hello@engineeringnz.org
www.engineeringnz.org
04 473 9444
L6, 40 Taranaki Street
Wellington 6011