

# The Accidental Collaborator: Participatory Action Research as an Emergent Framework for Sustainable Multi-Stakeholder Engagement

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## BACKGROUND

As part of a three-year review cycle, a series of post-graduate program review initiatives were conducted in 2013 by the Faculty of Engineering and Information Technology (FEIT) at the University of Technology, Sydney (UTS), Australia. This was conducted through an Industry Engagement Project utilising multiple research methods to gather information from various stakeholders.

## PURPOSE

This paper aims to present two levels of project reflections based on the postgraduate review initiatives conducted. Firstly, it reflects on the mechanisms that lead to the emergence of a multi-stakeholder action-research framework that is practitioner-orientated, reflective and collaborative. Secondly, it reflects on the attributes and skills necessary to inform such a framework.

## DESIGN/METHOD

This paper draws from academic literature about emergent research processes and action-research mechanisms to support the reflections made. This paper reflects on the collaborative stakeholder engagement process that commenced in 2013 as a participatory action research process. The research process involved a series of research initiatives as consultation and collaborative mechanisms to investigate and review the current postgraduate courses on offer.

## RESULTS

Information elucidation through traditional research approaches (surveys, interviews) is perceived as insufficient for project robustness, sustainable engagement and knowledge validation. Through various research strategies, a pragmatic stakeholder engagement framework applicable to education and industry collaborative processes emerged. The collaborative action-research initiatives provided added momentum for a series of incremental changes in different Engineering and Information Technology (EIT) courses. Another key outcome is the inception of discipline-specific Professional Advisory boards (PAb) in 2014. These are networks of academics, students, graduates and industry members that undertake to advice and review faculty courses from multiple perspectives in order foster currency and relevancy in teaching and learning outcomes. Collaboration and engagement are now fundamental characteristics within the mechanisms of the project. Attributes that contribute to an effective action-research framework include communication, iterative research design, co-creation, embracing uncertainty, adaptability, openness and critical mindedness. Skills supporting this collaborative process include effective team and project organisation, communication, multi-methods research and group facilitation capabilities.

## CONCLUSIONS

Participatory action-research framework is observed to provide multiple stakeholders with different avenues to share their priorities and interests. This paper demonstrates that emergent research methods can be structured into contemporary action-research approaches that translate well as stakeholder collaboration, engagement and advisory frameworks.

## KEYWORDS

Multiple stakeholders, participatory action research, industry engagement, collaborative framework

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## Introduction

As part of a three-year review cycle, a series of engineering and information technology (EIT) post-graduate program review initiatives were conducted in 2013 by the Faculty of Engineering and Information Technology (FEIT) at the University of Technology, Sydney (UTS), Australia. This was conducted through an Industry Engagement Project utilising mixed-methods in research to gather information from multiple stakeholders. The projects aim to evaluate the value and relevance of existing FEIT UTS Post-graduate courses from the stakeholder perspectives of industry, alumni members, students, graduates, program directors and academics. The insights also served to inform the continuous improvements made to the programs in line with recent TEQSA, AQF, accreditation and industry requirements and changes to ensure relevancy and currency. The intention is to integrate industry and student needs with academic contributions to enhance the university's postgraduate offerings to students and finally, to ascertain feedback and action from academic stakeholders in order to 'close the loop' or act on the knowledge based on data supplied by the participants.

This paper describes the emergent developmental process in the project as a case for reflection and discussion. The reflective view adopted in this paper is inspired by Schön's (1983) work on the reflective practitioner and motivated by the practice of action research specific to the education curriculum (McKernan & McKernan, 2013). This paper reflects on the collaborative stakeholder engagement process as an emergent and participatory action research process. This paper aims to present two levels of project reflections based on the postgraduate review initiatives conducted. Firstly, it reflects on the mechanisms that lead to the emergence of a multi-stakeholder action-research framework that is practitioner-orientated, reflective and collaborative. Secondly, it reflects on the attributes and skills necessary to inform such a framework.

## Literature review: Engineering education research as a collaborative stakeholder process

Recent researchers argue that collectively, a combination of research methodologies might allow the research community to be able to better address questions around key engineering education challenges (Case & Light, 2011). Borrego et al (2009) argue that a wider range of data collection methods will allow researchers to address a wider range of research questions. Koro-Ljungberg and Douglas (2008) suggest that there are a range of different perspectives, grouped under the term 'situational perspectives' that engineering education researchers could consider. Situational perspectives are focused on delivering inductive and emergent understandings of particular situations or experiences throughout the data collection and analysis process. Subsequently, the use of Action Research (AR) is said to produce knowledge, action and strategic improvement in practice (Carr & Kemmis, 2003; Reason, 2001). Improvement occurs through the active engagement of the practitioners since AR is research with subjects, not on them (Case & Light, 2011). Therefore it can be said that AR has a collaborative intent. This is because the epistemology of action research means that it is only possible to do research with persons, including them both in the questioning and sensemaking that informs the research, and in the action which is the focus of the research (Carr & Kemmis, 2003; Case & Light, 2011; Reason, 2001).

Through the process of co-constructing research and knowledge, participants are also empowered through a collective and cyclical process of self-awareness, self-inquiry and reflection (Fals Borda & Rahman, 1991; Kember, 2000). AR consciously embarks on advancing teaching practice through decisions and actions that are informed, but not constrained, by research and theory. It is flexible, reflexive and subject to the practitioner's critical and rational practical judgments. Case and Light (2011) posit that AR of this nature could be an effective approach for engineering faculties interested in implementing

substantial personal and social change in their practice. Contemporary forms of action research emphasise collaboration between all those involved in the inquiry project (Reason, 2001), aiming to develop skills of reflective practice, collaboration and a culture of open inquiry as part of everyday work life, to develop learning organizations or communities of inquiry. Universities who engage in 'bottom up' planning, 'road-mapping' and foresight exercises are said to have a better chance at reaping future rewards than those focused on the short-term (Etzkowitz, Webster, Gebhardt, & Terra, 2000). Accordingly certain universities that attended to emerging interdisciplinary fields of molecular biology as early as the 1930s and 1940s became the early hosts to industrial complexes in biotechnology during the 1970s and 1980s (Etzkowitz et al., 2000). At Stanford Engineering School, the founders claimed that associations with local industry that had the capability for technological innovation provided impetus for them becoming a leading engineering school (Etzkowitz, 2003). Cambridge-MIT Institute (CMI) in the UK developed a knowledge sharing approach for the purpose of harnessing research done in elite institutions for commercial purposes (Acworth, 2008). In their multi-perspective model, the collaborative entities comprised academic researchers and educators, industry participants and government policy makers, who were brought together to develop a comprehensive and multi-faceted solution addressing technological, economic and social issues. Yet, most of the literature tend to focus on the process, and less attention is given to the collaborative experience, including attributes and skills required to facilitate a collaborative research process in a flexible and reflexive manner, supported by collaborative tools and technology where required.

## Research approach

The research process involved an emergent series of research initiatives as consultation and collaborative mechanisms to inquire and review current postgraduate courses on offer. These mechanisms were structured in three stakeholder groups involving students and alumni, industry representatives and academic staff. Project notes and detailed process mechanisms were also documented by the project manager to inform the development of a long-term framework. The process is illustrated in Figure 1.

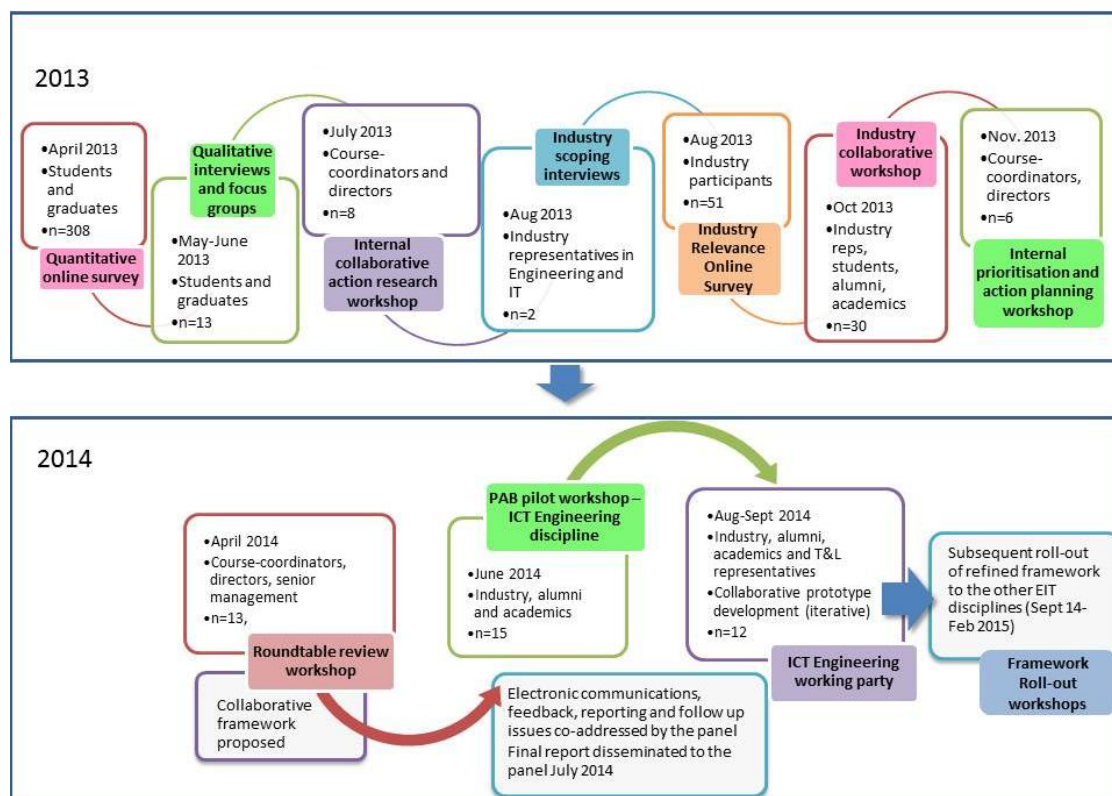


Figure 1: The emergent research and collaborative process 2013-2014 (present)

308 student and graduate respondents were surveyed and 13 participated in interviews and focus group discussions. A further 30 industry, alumni and academic representatives participated in interviews and workshop discussions, whilst 51 industry respondents took part in an industry survey that investigated industry priorities of various learning and development functions, areas of learning that are deemed relevant and important. The data collected provided insights on student and recent graduate perceptions of their learning experiences and how it contributed to industry, career and work opportunities. Drivers and barriers of learning were discussed. With industry, the importance and relevance of various levels of education were discussed, including the emerging trends and challenges, industry priorities, roles and expectations in ensuring relevance. In between research activities with external stakeholders, academic workshops were organised to deliberate on the findings that emerged and discuss the next steps of inquiry and action in the process.

### **The project team and collaborative roles**

The core project team includes the Associate Dean of Teaching and Learning, and a Project Manager. The team is supported by an administrative assistant. Internal academic collaboration and communication mainly involves senior academics, industry engagement partners and course-coordinators who collectively form part of the extended project team.

The project manager's response to the initial brief (3-yearly review) was to focus on the process of research and facilitating collaborative dialogue to co-create actions that would lead to feasible and practical solutions for the short, medium and long term. Through regular communications, iterative internal academic consultation meetings and review sessions facilitated by the project manager, faculty members provide input into the development of the industry engagement project and research process, as well as how the areas of exploration could impact on their own disciplines. Additionally, through the methods applied, project members are encouraged to be researchers and reflective practitioners (McKernan & McKernan, 2013). Whilst the project manager has the autonomy of leading the project through different methodologies, the approach chosen therefore means having multiple roles and competencies – as a consultant, researcher, facilitator, analyst and collaborator.

The project manager as researcher also ensures that criteria for reliability, generalizability, traceability and transferability are considered (Borrego et al., 2009) although there are often limitations in terms of quantitative sampling and statistical rigour at times. The rich descriptions of the teaching and learning context and experiences of the participants are seen as essential in qualitative research to ensure trustworthiness. The insights (de-identified) from the multiple research methods are presented to and evaluated by participants in what can be viewed as collaborative action-based workshops. Ultimately the insights help to inform the mission, vision and values for a collaborative stakeholder framework. The project and framework that is currently being designed and piloted is deemed robust, credible and sufficiently rigorous as it can be traced back to particular insights to inform the decisions made.

## **Results**

### **The emergent and iterative process**

To collectively find a way forward, it was important to engage the different stakeholders to get a range of perspectives and explore the complexities of teaching and learning in EIT education. Values generated through the research insights as important were critical thinking, insightfulness, openness, adaptability and agility, commitment, relevance, forward thinking and technical knowledge. These are included in the engagement framework, and form the values driving the project team. The proposed framework was shared with other internal stakeholders to then contributed further ideas into its development and structure, including the naming of the framework. The focus of most of the collaborative sessions was

about how insights and suggestions from previous rounds of research could be incorporated in a feasible and sustainable manner for the long term. Speaking widely with faculty teaching and learning members and using both quantitative and qualitative research, the project manager cum researcher discovered a mixed range of concerns ranging from stifling bureaucracies in the system, anxieties about the implications of funding cuts, time-tabling, staff movements and the ability for faculty offerings remaining relevant to industry and attractive to the markets. It did not seem likely that previous review processes undertaken in the faculty was the most adequate approach for the present and future. In bringing in academics, students, alumni members and industry representatives as active participants closer into the cyclical and collaborative nature of the research, including planning and generating ideas and solutions, this meant that the research began to engage and link stakeholders and EIT education in a process of continuous improvement. This also contributes to building the faculty's capability of becoming continuously relevant and current in a dynamic environment. Beyond that, we recognised that many of the ideas were already in practice in several programs and courses. We learnt that these plans and processes needed to be integrated consistently across programs, and that systems and clearer structures needed to be in place to support changes made in response to industry and stakeholder feedback. For example, an academic commented,

*"We are doing some aspects, for example, interacting with industry in terms of projects, but we don't really have anything like a sort of a process [more structure] within the Faculty within engineering." (Internal prioritisation and action planning workshop, November 2013).*

We also found that having practice-based industry projects mean that the university and faculty would need to be able to communicate more pro-actively and collaboratively with industry, ensure a way to organise, manage and assess the collection of projects, industry and students. Furthermore, collaborative inquiry with a wider group of stakeholders would enable the project group to consider areas that are less common, less certain or unknown to us, to challenge the orthodoxy and potentially take some necessary risks in forging the way forwards, where necessary. From the collaborative conversations, tacit experiences and knowledge were brought to the surface. On this basis participants identified graduate and professional capabilities and technical competencies they believed the industry would most require currently and in the future. Throughout the various stages of consultative research, findings were disseminated among course academics and industry partnering staff. Many of the insights are not new although through questions asked, the perspectives and current ideas gathered highlighted needs that were still not yet fulfilled, and identified emerging industry trends and opportunities for improvement. In this endeavour, students, graduates, the alumni and participating industry professionals were given a voice to share their priorities and interests.

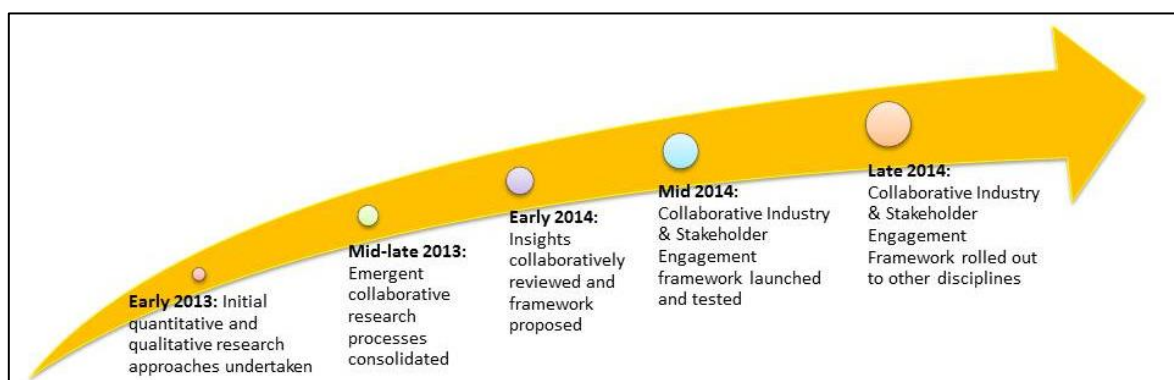
It was also observed that as the research progressed, participants began to engage and contribute to future research questions and inquiry methods, and drew on the insights and their own practical experiences to inform the next steps of decision-making and action. It was also apparent that a major challenge was to ensure continued stakeholder relevance and engagement. Any framework for meaningful collaboration and engagement would need to meet the diverse needs of the different disciplines and stakeholders. To achieve this, communication and close collaboration between the project manager and the various stakeholders was the modus operandi. Research and workshop questions, agendas and approaches were co-generated with academics. Co-sharing of knowledge, perspectives and experience was encouraged at workshop sessions. As a result, the project team co-developed a stakeholder advisory and review framework purposed to co-create knowledge and actions whilst learning something more ourselves.

## **The Professional Advisory Framework**

The team incorporated processes within the project that allowed a more open and reflective consideration of ensuring relevance and currency in EIT education by addressing complex

and emerging industry issues through engaging and collaborating with multiple stakeholders. Through the development of a professional advisory framework, the focus was on becoming a faculty seeking to lead and introduce new ideas, engage with stakeholders and create collaborative spaces in which further ideas and plans can be co-created, discussed and co-reviewed. Where the process is likened to action research is where those involved in the research endeavour start to become co-researchers (McKernan & McKernan, 2013), whose knowledge, thinking and decision making contributes to generating ideas, designing and managing the project, drawing insights and conclusions from the research experience (Reason, 2001; Whyte, 1991). Together the participants make sense of the insights and collaborative process inform participants' and researcher's work and future decisions made, including relevant areas to include in developing the collaborative framework. For the most part, the project team in partnership socially constructs the collaborative framework with key stakeholders from 2013- present 2014. This requires a committed, flexible and engaged group. Additionally, strong communication, team and project organisation skills are needed. In this case, capabilities in multiple research methods and group facilitation were key to the collaborative nature of the process. At the component level, each research element was cyclically designed mainly taking into account previous insights, in the quantitative or qualitative research as described in Figure 1. Nevertheless it has to be noted that program changes still needed to be aligned with industry regulatory requirements, accreditation stipulations, faculty and university policies, AQF and TEQSA requirements.

In addition to solving practical problems, the contemporary form of action research as practiced in this project also aims at making change and learning a self-generating and self-maintaining process in the advisory and review process. This means that the self-development capacity of further PABs ought to continue even if the researcher is absent from the project. Additionally, in conventional research, the participants do not have a say in the process for example in surveys and interviews. In AR, those who experience the problem are actively involved with the researcher, at least in selecting the problem and sanctioning the search for solutions. This inter-dependent relationship requires iterative feedback-action loops and active interaction with the people involved. Collaboration thus supports the on-going generative and emergent nature of the AR process. Participants are involved in designing the inquiry and making sense of the data. From Figure 2, early 2013 insights from traditional forms of research acted as a catalyst for further collaborative research design and methods used in the review. This led to series of smaller incremental changes in different EIT courses and programs.



**Figure 2: Timeline of the emergent research and collaboration process**

Another tangible outcome from the iterative learning and reflective process is the inception of program or discipline-specific Professional Advisory boards (PAB) in 2014. These are designed as networks of academic industry members that undertake to engage, advice and review faculty programs or courses from an industry's perspective in order to inform program and course leaders to design and deliver relevant teaching and learning objectives and outcomes. Underlying the mission is the opportunity to attract quality members in academia and industry to network, partner, inspire and engage in discussions around current and

emergent industry demands to ensure that our faculty programs/courses remain relevant and valuable to industry. This collaborative and evolving AR framework will be continuously reviewed and further refined. Its impact across various disciplinary contexts will be evaluated to optimise the framework's efficacy for future iterations. While AR frameworks in themselves may not be a new concept, what is new is the adoption of action-research in the consultative process in order to inform EIT program decisions and design by involving and valuing key stakeholders in the process.

## Discussion

Collaboration and engagement are necessary characteristics of the project, although one-way information elucidation through traditional research approaches (surveys, interviews) can be perceived as insufficient for project robustness, sustainable engagement and knowledge validation. The emergent research process and participatory AR approach lends a pragmatic perspective in developing a robust and agile framework for educators and project members desiring to integrate multiple stakeholder expectations with faculty program deliverables in a way that is valuable, relevant and rewarding.

From the reflections, seven underlying attributes that contribute to an effective action-research and collaborative framework are identified – communication, iterative research design, co-creation, embracing uncertainty, adaptability, open-ness and critical thinking. Skills that were observed to support the success of a collaborative process include effective team and project organisation, communication, multi-methods research and group facilitation capabilities. Another perceived outcome of this process for the individuals is that the researchers, project managers or drivers and engaged participants themselves become collaborators, consultants and reflective practitioners.

Where do we see this project heading? AR as an approach here means that we are focussing on implementing and evaluating a complex, long term and more sustainable advisory framework that involves not just coordinating routine review meetings, but also aligning processes with faculty strategies, developing acknowledgement and incentive systems, enlisting relevant project members, and developing closer links with course and faculty committees, and providing support for academics to autonomously manage their own professional boards. Participation cannot be imposed but is an emergent process (Elden & Chisholm, 1993). It is a result of the character of the problem and context under study, the aims, skills and capacities of the project team as researcher and collaborator (Greenwood, Whyte, & Harkavy, 1993). At FEIT UTS, we did not start out with a structured AR process. From an emergent adoption of different research processes and continuous participant engagement and collaboration at different junctures we eventually adapted the practice as participatory action research (PAR) (Greenwood et al., 1993; Sankaran, Tay, & Orr, 2009). Participation increased over the life of the projects as a dynamic response to emergent possibilities, facilitated by continuous communication and organisation of the project managing team. In this design, course coordinators as researchers can co-create arenas of inquiry within the framework and develop the opportunities to work together with industry and stakeholder partners to co-create shared language and new knowledge to inform their programs.

Participatory AR emphasizes participation, co-learning, collaboration, incorporation of local knowledge, and organizational transformation (Greenwood et al., 1993). It is often eclectic and diverse since it mobilizes theory, methods and information perceived as relevant from the participants' points of view and thus complex, dynamic, and multi-causal and multi-dimensional. Since the process is emergent in nature, it cannot be fulfilled completely as it is an on-going continuous cyclical process of development. By the same token, participation, the framework and its process implementation can always be improved. The challenge is to enhance participation and engagement from stakeholders, to realize it as a self-managed process, and to link it with some manageable action and eventual measurable outcome.

## Conclusions

The participatory action-research framework provides multiple stakeholders like students, graduates, the alumni and participating industry professionals with multiple avenues to share their priorities and interests. Subsequently, the project manager in the framework transforms into both researcher and collaborator in the process. Having a project manager that tenaciously drives the process of collaboration and follow up is often needed to lend momentum, energy and structure. Participants themselves are encouraged to collaborate and reflect upon their practices and anticipate emerging needs specific to their own environments. Whilst champions and leaders are often necessary, to ensure the sustainability of such efforts, it is desirable that participants eventually become highly empowered and self-organised, where stakeholders independently continue to collaborate and co-create knowledge, new industry-linkage initiatives and novel teaching and learning solutions envisioned and valued by all involved. Participatory action research embodies participation and relevance better than most other forms of research (Greenwood et al., 1993) but it is not always deployable in every situation. In this case, the project team recognised the opportunity to do something different. The leadership style was open and collaborative in nature. The project manager had a project goal and the autonomy to fulfil the project goals within the resource constraints.

Collaborative relationships emerge over time, and may require careful facilitation for them to emerge at all (Reason, 2001). This faculty-stakeholder linkage capability gives the faculty the ability to identify confluence of interest between internal and external stakeholders, and their academic counterparts. These collaborative roles (accidental or planned) are identified as emerging interface professions by Etzkowitz et al (Etzkowitz et al., 2000) to help make introductions, organize discussions, and otherwise act in an intermediary role to facilitate interaction with their counterparts and other potential partners in different stake-holding groups including academics, researchers, students, alumni, government and industry.

With the recent and radical 2014 Higher Education budget announcements by the Australian Federal Government, we should not underestimate the significance of funding shortages pushing academia in this direction (Etzkowitz et al., 2000), prompting change through innovation and creativity in the way to move forward through different means like collaborating and co-creating educational direction.

This paper demonstrates that contemporary action-research approaches can be structured into an emergent advisory process that translates well as a stakeholder collaboration, engagement and advisory framework. It can foster collaboration and critical thinking amongst its participants. By nature, the methods used were interactive, emergent, reflexive and longitudinal. We hope that the emergent processes that are devised through the use of multiple perspectives might increase the likelihood that other EIT educators too, would may it useful, practical and effective in generating collaborative inquiry and engagement with multiple stakeholders. The knowledge outcomes of such collaborations will be further developed and improved as it is still in its early phases of implementation. From observations so far, the framework is proving to be a more robust approach in providing technical, industrial and practical angles that ensure that EIT education remains relevant and current, whilst anticipating emerging needs.

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