

# **Relational Agency in First and Further Year Group Work**

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## **CONTEXT**

At the University of Technology Sydney (UTS), first and second-year students in engineering and IT develop professional practice skills through project-based work with significant group work components in large, 500+ student cohort subjects. Some students find group work challenging and do not appreciate its importance to their professional practice. In looking to improve the transition of our students into and through university, and then into professional practice, we are revising our subject activities. This paper looks at teamwork through the lens of building students' capacity for relational agency.

## **PURPOSE OR GOAL**

Relational agency is a valuable capacity for professional practitioners working in complex, inter-professional environments (e.g., Edwards, 2010). This paper makes a case for the development of this capacity in engineering and IT students. As a first step to reviewing our group work activities, we report on a pilot study investigating the current capacity for relational agency in our students, and more broadly evaluating the relational agency framework as a tool to help us understand teamwork. The findings will inform further study into relational agency in students and tutors, and will form the basis for redesigning group work and tutor training.

## **APPROACH OR METHODOLOGY/METHODS**

Focus groups on group work experience were held with students from one second-year and two first-year subjects. Inductive qualitative content analysis used data from the focus groups to look for evidence of relational agency and identify emerging themes. The results were triangulated using self and peer review data from the students and their teammates.

## **ACTUAL OR ANTICIPATED OUTCOMES**

The data indicates that the capacity for relational agency develops with time at university. This provides support for the proposed structure used to identify relational agency as progressing from 'novice' to 'professional'. Absent aspects of relational agency were identified, such as a lack of agency in aligning motivations. Emerging themes indicate aspects of teaching that may inhibit or facilitate the development of relational agency, including a continued focus on a strengths-based approach, consideration of the psychological safety of students, and a focus on communication (remote or in-person).

## **CONCLUSIONS/RECOMMENDATIONS/SUMMARY**

The paper builds on translational research in higher education practice and contributes to our understanding of the development of professional practice skills in engineering and IT students. It has shown that development of the capacity for relational agency is a valid lens for reviewing group work activities and has identified avenues for future focus groups with tutors and a wider range of students.

## **KEYWORDS**

group work, relational agency, transition

## Introduction

At the University of Technology Sydney (UTS), engineering and IT students encounter their first multidisciplinary core subject in first year. They are expected to begin to develop professional practice skills while working with students in different degree majors. An explicit focus for first year core subjects has been to support the transition of students, academically and socially, into university learning and into the discipline of engineering and IT (Kift, 2008; Sparks et al., 2014). Through embedding transition pedagogy into the design of our subjects, we aim to begin to develop students' identity and sense of belonging (Sparks et al., 2014). While the transition pedagogies focus on the first-year experience, further years of study are being redesigned in recognition that a 'whole of course' approach allows us to develop these student attributes.

To support students' transition, we are looking to redesign group work activities for project-based subjects. First-year students work in groups in an unfamiliar environment and with unfamiliar people. While many students find that the resources and activities support them sufficiently, some students find group work challenging and do not recognise the importance of teamwork to their professional practice. This may be based on a belief that engineering is solitary work. Some students fail to recognise that “no amount of technical expertise can isolate [one] from the need to work with other human beings” (Trevelyan, 2014 pp. 22). Student feedback in second and subsequent years shows that this perception continues.

*In industry, certain engineers will not be working with other types of engineers ie. It is extremely unlikely that a software engineer would ever be working alongside a civil or environmental engineer. (Second-year subject, Student Feedback Survey 2020)*

Extracts from student feedback surveys suggest that some students dislike group work as it is perceived to bring about an unequal distribution of work with lack of participation from some group members. This lack of participation may be due to a lack of confidence, fear of having work harshly criticised, or to a difference in motivation or goals. This view was found in the student feedback surveys:

*... marks associated with a team who aren't as hands-on or proactive as myself is a detriment to my own marks and is not a proper representation of my skill level (Second year subject, Student Feedback Survey 2020)*

*The group project is difficult when other team members are not motivated or dedicated to complete the task. It affects me and the others who are dedicated. It would be better if this aspect of the subject could be overcome. (First year subject, Student Feedback Survey 2019)*

Recognising other practitioners as resources and understanding the value they bring, as well as the shared knowledge developed by working together is part of the concept of 'relational agency'. Edwards (2005, p. 173) describes relational agency as “a capacity which involves recognising that another person may be a resource and that work needs to be done to elicit, recognise and negotiate the use of that resource in order to align oneself in joint action on the object.” Relational agency argues that collaborators on a task will bring their own interpretations and motivations to bear on any activity, and that aligning these motives needs attention in order for joint activity to be most successful (Edwards, 2010). Misalignment in motivations seems to play a part in dissatisfaction with group work with our students, as indicated in the previous comments. Edwards (2005) explicitly recognises that relational agency is a capacity that can be taught and developed.

Our student feedback surveys give limited, mixed reports on the current capacity for relational agency. Some students do not see 'other' professional skills (in this case other majors) as adding value to their activities:

*Forming groups of students from different engineering majors randomly did not make this subject constructive or beneficial at all. Each student from a different engineering major has their own set of skills and engineering knowledge pertaining to their respective engineering field and industry. As a*

*result, deciding on what solution to ideate as a group was too difficult. (Second Year Subject, Student Feedback Survey 2020)*

While others demonstrate limited appreciation for some of the concepts in relational agency:

*Collaborative group allowed me to make new friends and understand the work content better. (First year subject, Student Feedback Survey 2020)*

We hypothesise that developing students' capacity for relational agency improves their experience of group work and that by explicitly fostering a relational agency mindset, we can develop a better appreciation for the value of this capacity to their professional practice. To investigate this, we have begun by attempting to understand the current state of our students' capacity for relational agency.

This paper describes a study of students in two first-year and one second-year group project based subjects to gain insight into using relational agency in our context. By examining group work through a new lens, the paper builds on translational research in education practice and contributes to understanding how professional practice skills in engineers and IT professionals develop.

## **Relational Agency in Engineering Education**

Literature on relational agency as a beneficial mindset for professional practice originated in work on inter-professional collaborations (Edwards, 2005). It has since been expanded and developed in a number of studies which looked at professionals working in education, health care, welfare programs and software engineering (e.g., Edwards 2010; Pyhältö & Keskinen 2012; Kinti & Pouloudi, 2019). Edwards (2010) differentiates relational agency from other "networked support" frameworks, where practitioners will request the resources they need to support their own interpretation, and clarifies that:

*[r]elational agency is not simply a matter of collaborative action on an object. Rather it is a capacity to recognise and use the support of others in order to transform the object. It is an ability to seek out and use others as resources for action and equally to be able to respond to the need for support from others (Edwards & D'Arcy, 2004).*

Relational agency is described as emerging from an iterative two-stage process where practitioners: (a) work with others on an object or task, developing their interpretations of it by recognising and eliciting the resources that others bring to the collaboration; and (b) align their own actions and contributions with their new interpretation of the object or task (Edwards, 2010). This emphasis on reciprocity is described by Smith, Julie, Holman & Smith (2019), who characterise the outcome as a "mutual strengthening of competence and expertise". It is this capacity of the practitioner to be an agent in the process of recognising, eliciting and using others' interpretations in problem-solving, and consequently adjust their own interpretation, that can be learnt (Edwards & D'Arcy, 2004; Edwards, 2005).

The literature investigating relational agency in engineering and IT is limited. However Kinti & Pouloudi (2019) report on the role of relational agency in a software development collaboration which involved a team with multiple experts working to solve a problem with high levels of ambiguity and uncertainty. This working in complexity can be argued to be typical of engineering and IT professional practice.

A study by Pyhältö & Keskinen (2012) analysed doctoral students' sense of relational agency. Students were classified as either perceiving themselves to be active relational agents or passive "objects" with little or no agency in their community. Those students who saw themselves as active "subjects" identified reciprocity in their relationship with the community and in many cases emphasised the role of their supervisor in promoting their agency. Most students saw themselves as objects and this correlated with more negative emotions, a lower level of interest, and more frequent consideration of abandoning their studies.

Relational agency has not yet been investigated in the context of undergraduate studies. We argue that the application and advantages of a capacity for relational agency, described in the literature and presented here, apply to students transitioning into the university community, and later in their professional practice. Relational agency may be employed as a framework for understanding and supporting collaboration in our group work projects where students from all engineering or IT majors must work together on an object - in this case an assessment item. As students transition through their degree, we aim for them to develop the capacity and personal agency to elicit, recognise and value the resources that team members bring to bear on an assessment item, and then adjust their own interpretation and reactions to the tasks, creating new, shared knowledge. Included in this is the recognition of other peer groups, tutors and lecturers as resources that can be used to improve outcomes.

## Methodology

This study aimed to analyse the current capacity for relational agency in our students. An inductive, qualitative approach was taken. Participants were recruited from 1600 engineering and IT students who completed one of two first-year or one second-year subject in the first semester of 2020. These project-based subjects involved multidisciplinary groups of four to six students and included multiple self and peer review activities. Twelve participants were selected from those who responded, representing all of the subjects, none of whom had worked in the same group.

Focus group data was collected in two, hour-long, online focus groups which were audio-recorded and subsequently transcribed. The focus groups involved semi-structured, open-ended questions related to students' experience of group work (not limited to the subjects under study).

The data from the focus groups was analysed for emerging themes demonstrating students' capacity for relational agency. Based on previous research focussed on PhD candidates, relational agency would be demonstrated by whether students identified themselves as subjects or objects in a relational interaction. As students represented different years of study, we hypothesised we might see a development of capacity across the cohort of participants.

We triangulated our focus group data by comparing it with the self and peer review data collected as part of the group feedback and assessment moderation procedures used in the subjects. Themes from data analysis were identified and explored for discussion and as a basis for future research.

All names have been anonymised using pseudonyms.

## Results and Discussion

It was evident from the focus groups that students displayed a variation in their capacity for relational agency and that, not unexpectedly, the changes necessitated by the COVID-19 disruption were a focus for group work discussion.

We hypothesised that there may be a progression from students demonstrating very little capacity for relational agency, novice approach, towards a professional approach, where students demonstrate a higher level of agency. Such a novice-expert framing is common in studies on the development of expertise (e.g., Atman et al. (2007), Daniel and Mazzurco (2020)). In analysing the data, it emerged that these variations could be coded through demonstration of significant relational agency capabilities:

- recognition of others as resources (from no recognition, to a means of saving time and effort, through strengths-based resource identification, to recognition of resources other than the immediate group including peers and teachers)
- personal agency in eliciting interpretations, aligning motivations and contributing to the collaboration (from doing what others tell them and viewing themselves as objects in

the interaction, through recognising the reciprocal nature of the process, to viewing themselves as impactful agents in the sharing)

- adjusting own interpretation and behaviour based on the contribution of others.

Based on an inductive analysis of the data, these traits were coded into five stages described in Table 1 below. These were used to categorise the participating students' current level of relational agency. These levels are supported by quotes displaying typical attributes.

**Table 1: Relational Agency Coding Levels**

Lvl	Description	Sample student quotes
0	No/little agency Students do as they are told by others. View themselves as objects in the collaboration.	<i>I didn't see any of my group members faces until the last week ... [a]nd there's not much you can do about that.</i>
1	Recognising other people as resources Students recognise that others are resources to assist in completing tasks	<i>Sometimes when the roles were not equal we did have something left over then someone with least amount of weighting would take that task.</i>
2	Eliciting work from other people Active agency in eliciting work. Recognition of the value of different resources	<i>I was the one delegating task to the group all the time so I was the one being like the leader and they had no issues. I asked what they would prefer to do and if they had no preference then I would just put them in random ones.</i>
3	Pro-active engagement Agency within and outside of the group (e.g. with tutor), recognition of reciprocal contributions, giving feedback to peers to build their capacity	<i>...we cross check each other's work and provided feedback as we went along.</i>  <i>OR</i> <i>Our group discussed if any knew solution if not then we talked to tutor.</i>
4	Adjusted interpretation Self-awareness of group dynamics and reciprocity, adjusting personal interpretations or behaviour	<i>For other group they tend to be shy so I have to be the one to speak up and it was difficult as no one was speaking and try encourage everyone to participate that was challenging and at the same time it gave experience and there are different kind of people and so we had to deal with them and so gain some experience. After that I feel confident speaking in groups no matter what group so it is a good thing.</i>

In the focus groups the capacity for relational agency was more common in students as their university career progressed. This was not related to the subject they were taking, for example Bhavna and Larry who were doing the first-year subject and had comments that showed a Level 4 understanding, indicated that they are in their second and third year of university respectively. There were exceptions such as Robin, a first-year student doing the first-year subject, who had comments coded at Level 4.

Students demonstrate capabilities at multiple levels. For example, those that demonstrated a Level 4 understanding in some circumstances, demonstrated a lower-level mindset in others. This is not unexpected: students reflected back on previous experience (not only those in our

subjects) and the context of group work will affect how students approach the task (for example the structure of the assessment and instructions from teachers may guide students to a more transactional collaboration). The fact that there are circumstances where even those with high levels of relational agency collaborate without using the capability suggests that the design of activities should afford students the ability to make use of their capacity. These activities could potentially be used to demonstrate behaviour to help develop students who need growth in this area. If Robin in first year has the capacity for a high level of relational agency, our activities should allow this to be practised, while Ankit, a postgraduate student whose highest level was 2, should have the opportunity, vocabulary and modelled behaviour available for him to practice and develop a relational agency mindset.

While most students in the cohort were high-achieving (distinctions or above in their subject), there was no apparent pattern seen between their grades for the subject and their coded relational agency level. However, when looking at self and peer review data from students demonstrating a capacity for Level 3 or Level 4, they showed a more detailed response than their teammates and in many cases, gave both positive and negative feedback. This supports their demonstration of an increased capacity for relational agency. While the participant cohort of high-achieving students may be a confounding factor in the analysis, it is possible that the richness of feedback (as compared to their team members) in self and peer review activities may be an indicator of a high level of relational agency capability.

There were some aspects of relational agency which were rarely observed in the discussion, notably aligning motivations. Most students felt that misaligned motivation was a cause of problems but felt little agency in being able to align these motivations. Misaligned motivations have been identified as a problem from previous feedback surveys (see above). Dewi was an example of this:

*I would agree in the sense that group work is important but I think it works best when it is with people that are equally motivated because I was with a group and we did not have same goals so did not have same standards that we wanted to achieve.*

The researchers identified themes emerging from focus group data indicating factors which inhibit or facilitate the capacity for relational agency. Most significantly these were a sense of psychological safety, recognition of a strengths-based approach, and communication.

## **Psychological safety**

Psychological safety is the student's perception of the consequences of taking interpersonal risks in a particular context (Edmondson & Lei, 2014). Abigail commented:

*I found the communication within that group was also quite a struggle on first team meetings because people were really reluctant to say anything.*

This was also mentioned by Robin:

*From my experience in group work, they only contributed for assignment but then anytime we had to break out in group chat and they would not say a word and it was really difficult.*

There were activities that students identified as helping to develop psychological security, such as icebreaker. Bhavna commented on this:

*I found during workshops, there was always an activity breaking down into smaller groups and you all have to work individually and having fun activities to do actually helped us connect.*

In a twelve-week semester, students noticed changes in the way the groups worked as members developed more confidence in themselves and their teammates. As Larry said:

*So there was a progression from quiet to becoming more vocal. I actually became friends with some of my group members and I am still friends after the subject.*

Not all of the changes over time were to the benefit of group dynamics, however, problems with groups give a chance for students to develop an understanding of the importance of having capacity for relational agency. As Abigail reflected:

*I would actually say that relationships got worse over the time as people did not know each other initially so everyone was friendly. But over time when work was not as per standard we had to provide feedback to each other and when other people did not understand why the work was not up to standard when they thought it was raised conflicts. So it was quite hard to navigate that process and so I believe relationships suffered because of that.*

This focus on psychological safety gives us an indication on how to remove potential barriers to the development of relational agency capacity.

### **Strengths-based approaches**

One aspect of relational agency is making the most of the resources that different team members bring to the collaboration. Some respondents recognised the value in dividing up tasks by the different skill sets and interests of the members. This is sometimes called a strengths-based approach (Pattoni, 2012). For example, Ankit described how his team allocated work by members' interests rather than by equal volumes:

*In group work, we discuss our strengths and so some people might be good at graphs, some might be good at report writing. Based on this we divided tasks rather than dividing equally we divided tasks based on interests. We focused on end result of submitting a good completed report rather than focusing on amount of work each of us did.*

Tamar reiterated this approach which is currently an explicit part of the first-year subjects. Sarah recognised this, commenting:

*We did the same for Engineering Communications and this subject was very good and they helped us to identify strengths of the group and they also told us to delegate work according to strength and not quantity.*

This approach was not taken in all instances, even though students came to appreciate the value it would bring. For example, Jenny reflected that she:

*did not know their strengths and weaknesses so if there was work I would really do it myself as I did not know who else would really do that or if I give it to someone else I don't know if they would do it well. So knowing strengths and weakness at the beginning would have been helpful.*

### **Communication challenges**

We expected social distancing due to COVID-19 would affect students' sense of agency: they may perceive themselves either as objects subject to the new environment, or active agents who have new ways of demonstrating agency. This emerged as a recurrent theme where students identified the difficulties that online collaboration posed compared to face-to-face. Ankit commented that "when face to face it is easier to get adjusted, and see the body language", while Sarah felt that the invisibility of being online meant that "people might feel less guilty and less afraid of not concentrating and not doing what they are supposed to be doing" and that in an online environment it "is very hard to develop meaningful relationships".

The ability to mute microphones and turn off cameras often hindered communication, Gareth explained:

*I didn't see any of my group members' faces until the last week when we did a rehearsal for the presentation. And I didn't hear some of them speak until like 6 to 7 weeks into the group work.*

Conversely, however, it gave Ankit the opportunity to avoid the toxic environment of a dysfunctional team: "I used to make stories of no internet, no camera and use to mute the conversations and that is how I used to escape the situations."

Some students identified advantages of engaging online. Emily found that “online it was a bit easier to communicate frequently”, while Bhavna felt that “in the online group it was much more transparent, people were not too embarrassed so even if you are in trouble people would just type out and ask for help”. Most students preferred face-to-face collaboration and lacked agency in dealing with communication problems caused by COVID-19 giving an indication of their capacity for relational agency (albeit in challenging circumstances).

## Conclusions and Future Work

Having identified relational agency as a framework to review the design of group work activities across three multidisciplinary, project-based subjects, this paper has conducted an initial study into our students’ current capacity for relational agency and presented a structure for analysing demonstrated levels of relational agency. We also identified factors that may inhibit or facilitate the development of a relational agency mindset, which we propose can be used in the design of group work activities and assessments in order to develop this professional practice capacity.

The proposed coding structure describing the capacity for relational agency as developing from novice to professional was partially validated by demonstrating the expected increase in capacity with increased time at university. In support of the framework is the fact that the coding structure correlated with improved self and peer review feedback by high-achieving students. However, there were aspects, such as personal agency in aligning other's motivation, that were not captured sufficiently in the coding. There is scope to develop a more nuanced definition, giving more precise language to discuss students' capacity for relational agency.

The focus groups have indicated where to focus activity design to help develop relational agency. This includes encouraging a strengths-based approach to collaboration, and activities (such as icebreakers) to develop psychological safety, which encourages transparency and accountability in communication.

Relational agency is a promising approach to analysing group work. Future focus groups will be run with tutors and students representing a wider range of time spent at university and grades distribution. We will look to develop and validate the coding used to demonstrate the progression from a novice to a professional capacity for relational agency. A validated framework will allow us a language to explicitly communicate the development of this capacity to students and tutors, as well as provide a structure for us to design activities and assess students' development. Eventually, our goal is to produce training materials to better enable tutors to support the development of relational agency in their students.

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