International Journal of Advanced Research in Education and Society
e-ISSN: 2682-8138 | Vol. 8, No. 2, 147-160, 2026
https://asianscholarsnetwork.com/asnet-journals

# Integrating Q-sort App in Pedagogy: Effects on Undergraduate Students' Subjectivity and Reticence

**Soo Ruey Shing[1*], Soubakeavathi Rethinasamy[1], Joseph Ramanair[1]**

[1] Faculty of Education, Language and Communication, Universiti Malaysia Sarawak, Kota Samarahan, Sarawak Malaysia

*Corresponding Author: rssoo@unimas.my

Received: 19 January 2026 | Accepted: 21 February 2026 | Published: 1 April 2026

DOI: https://doi.org/10.55057/ijares.2026.8.2.12

**Abstract:** *University students are always expected to hold and share various subjective points of view in class. Nonetheless, many instructors are facing difficulty promoting effective discussion as some students remain reticent and are reluctant to participate in class. In line with this, the present study examined the feasibility of Q pedagogy, an adapted Q Methodology-informed instructional strategy, in terms of its effects on (i) facilitating the expression of student subjectivity, and (ii) alleviating level of reticence and subscription of reticent beliefs in a university teaching context. Framed within the framework of Scholarship of Teaching and Learning and adopting an interventionist study design, Q pedagogy was tested on a group of 31 undergraduate students undertaking an ESOL course. To this end, a Q-sort task, Reticent Scale, Reticent Belief Index and a feedback questionnaire were employed to collect the required data. The results showed that the students were able to provide and assess all subjective views generated in the class using the Q-sort app. Additionally, the analysis of the intervention results showed significant effects in reducing the level of reticence and modifying four reticent beliefs, particularly beliefs that are related to the roles of listening in open class discussion. Also, the students perceived that the Q-sort activity helped them to contribute to class discussion. These findings have enriched the understanding of the potential of Q pedagogy on fostering equitable participation that ensures students' perspectives are represented in classroom discourse, enhancing decision-making, and alleviating reticent behaviour via an inclusive discursive space.*

**Keywords:** Q Pedagogy, Q Methodology, Class Discussion, Subjectivity, Student Reticence

## 1. Introduction

Aligning with the needs for 21st century education, many disciplines in higher education aspire for students to take active role in articulating their subjective views on various course contents and subsequently assessing a repertoire of subjectivity-based information generated in class. This is an essential skill for the students to navigate and thrive in their academic and future careers as it also leads them to engage in critical thinking and decision-making processes. A well-planned class discussion will provide rich subjective experiences for students. When they are guided to reflect on their own subjectivities and their classmates' diversified viewpoints on a given topic, it leads to enriching learning outcomes (Rieber, 2020). Following this perspective, Rieber added that once students are exposed and responded to subjectivities articulated in the class, they will come to "recognize and value diverse points of view while

realizing that others do not necessarily share their views" (p.140). This also serves to ignite interest and inquisitiveness in students.

University students are always encouraged and expected to adopt active learning roles in class discussion, which is a great platform to share subjectivities. Nonetheless, many instructors are facing difficulty to promote a fruitful class discussion as they are still experiencing a great deal of quietness in their classes as some students remain reticent or non-participatory (Meşe & Sevilen, 2021; Rieber et al., 2022; Satar, 2018; Zhou & Chen, 2020). Many university students exhibit reticence in oral participation, which inhibits their ability to express their ideas and engage in critical discussions. This worrying phenomenon has now become even more apparent and vexatious after the massive implementation of remote learning in the wake of the Covid-19 pandemic crisis.

Although university students come to class with subjective points of view on various subject matters, some of them may be reticent to share them 'directly' in an open forum like whole class discussion. They may find it difficult to express their opinion on a topic due to various factors, such as fear of judgment, lack of confidence, or faulty beliefs towards oral discussion (Bursalı & Öz, 2017; Soo & Goh, 2017, 2020; Zhou & Chen, 2020). This can be attributed to the nature of the current traditional class discussions which merely involve grouping students and getting them to discuss based on selected prompts immediately. Due to these reasons, class discussion may be dominated by students who are not reticent or more conversant in oral participation. This situation will certainly lead to imbalance engagement among the students. Therefore, this implies that reticent students need a safer space for them to express their views (Azwar et al., 2021; Tu, 2021).

## 2. Literature Review

### 2.1 Q Pedagogy as a Response to Participation Challenges

Various methods have been proposed to enhance students' oral participation in class, including the use of teacher interaction strategy (Lee & Ng, 2010), flipped learning (Fan, 2022), information-gap activities (Humaera et al., 2022), and socio-affective and pedagogic strategies (Zarei et al., 2019). These methods, which focus primarily on skills or strategy training that aims to get students to 'contribute' their voice in class discussion, have overlooked how instructors can elicit and value every student's subjective view in a way that could lead to a constructive classroom discussion. This is an important element particularly in helping reticent students who cannot provide immediate response which might have in turn caused them to subscribe to a faulty belief that discussion is for those who can speak fluidly (Soo & Goh, 2017).

Q pedagogy has been proposed to be a potential solution to the challenges. This pedagogy is claimed to be able to enhance students' participation in class discussions, particularly in guiding them to give and assess subjective ideas using 'Q sort', a data collection technique used in Q methodology (Rieber et al., 2022). This claim is grounded on the assumption that Q pedagogy can provide a relatively inclusive and safe space for all students to contribute their point of view that will be used as input for class discussions.

Q methodology was first proposed by Dr. William Stephenson as a research methodology to study subjectivity, and the data collection technique used is called the Q sort (McKeown & Thomas, 2013). Rooted in the theoretical perspective of Social Constructivism, the Q-methodology requires research participants to evaluate and interpret a set of statements based

on their own views before sorting them on a grid (Watts & Stenner, 2012). This is then followed by conducting a quantitative analysis of the factors that emerge from a factor analysis and construct their interpretations (Wilburne et al., 2020). The sorting and factor analysis can be performed using software such as PQMethod and QMethod. These software programmes allow researchers to create, administer, and analyze Q-sorts, as well as generate reports and graphs. Fundamentally, the Q pedagogy is an active learning approach or instructional strategy adapted from Q research methodology procedure in which learners are required to evaluate and interpret a set of statements constructed based on their own views before sorting them on a grid (Watts & Stenner, 2012). This is then followed by a quantitative analysis of the factors that emerge from a factor analysis (Wilburne et al., 2020). The outputs of the analysis will then be used for a more enhanced class discussion.

Nonetheless, despite its potential benefits, there is limited literature on the use of Q methodology in the context of pedagogy, specifically the effects of Q pedagogy on reticent university students' decision-making and promotion of student subjectivity in class. This gap is particularly significant to be addressed given the growing concern around the issue of participation among university students. Hence, this study was undertaken to investigate the feasibility of Q pedagogy in (i) enhancing undergraduate students' ability to express and assess subjective information, and (ii) alleviating level of reticence and subscription of reticent beliefs among students.

### 2.2 The Interplay of Subjectivity and Reticence in Higher Education Learning Environments

The concept of subjectivity, defined as an individual's communication of perspectives based on personal impressions, feelings, and opinions, plays a crucial role in understanding classroom dynamics (McKeown & Thomas, 2013; Akhtar-Danesh et al., 2008). Unlike objective facts, subjectivities represent inner thoughts, which are inherently complex and harder to observe. In the realm of tertiary education, classrooms are rich with diverse subjective experiences shaped by students' exposure to various narratives in dynamic and ever-changing contexts (Lundberg et al., 2020). These subjective views, when recognized and explored, serve as valuable resources for learning. Rieber (2020) argues that when students reflect on their subjectivity and engage with differing perspectives, it stimulates curiosity and deeper learning. Consequently, higher education often emphasizes fostering students' ability to form, defend, and negotiate viewpoints beyond merely acquiring subject matter knowledge.

However, eliciting and managing students' subjectivity in the classroom remains a challenge, particularly due to the prevalence of reticence among students. Reticence, initially conceptualized as a personality or anxiety disorder (Phillips, 1965, as cited in Keaten et al., 2009), has evolved into a multifaceted construct. Phillips (1984) provided a comprehensive definition, describing it as the avoidance of communication due to a belief that remaining silent is less costly than speaking. This conceptualization includes both behavioural and cognitive dimensions. The behavioural aspect encompasses social withdrawal and perceived deficits in rhetorical skills such as invention, disposition, and delivery (Keaten & Kelly, 2000; Phillips, 1984, 1997). The cognitive dimension involves a belief system that justifies communication avoidance, reflecting a faulty perception of one's abilities (Keaten et al., 1999).

These faulty beliefs play a significant role in reticent behaviour. Common misconceptions include the notions that effective speaking is innate, that speaking is manipulative or unimportant, and that remaining silent prevents others from perceiving them as foolish (Keaten et al., 2000). For reticent individuals, avoiding communication often feels like a rational

response to protect themselves from negative evaluation or the risk of embarrassment (Keaten et al., 2000). As Phillips (1986) observed, "incompetent or not, it is virtually impossible to perform competently if one does not believe it possible" (p. 358). This highlights the interplay between perceived ineptitude and actual performance.

The overlap between reticence and subjectivity is evident in the classroom context, where students' inner worlds often remain unexpressed due to their silence. Students' diverse subjectivity, which should ideally enrich discussions in class, are often stifled by their reticent behaviour. For instructors, this presents a dual challenge: to recognize and validate the silent subjectivities of reticent students while addressing the barriers posed by their communication avoidance. On this note, Rieber (2020) emphasizes the need for instructional strategies that engage students personally, enabling them to connect their subjective experiences with course content. Additionally, addressing the beliefs underlying reticence could also empower students to overcome their silence and actively participate in learning (Keaten & Kelly, 2000).

In conclusion, reticence and subjectivity are interlinked constructs that shape classroom interactions. Instructors play a pivotal role in creating an inclusive learning environment that acknowledges silent subjectivity while encouraging expression. By engaging students on a personal level using suitable instructional strategy in class and addressing the underlying cognitive barriers to oral participation, instructors can tap into the rich learning potential of their diverse perspectives (Rieber, 2020).

## 3. Method

### 3.1 Research Design

Framed within the framework of Scholarship of Teaching and Learning (SoTL), an 'interventionist study' was adopted as the research design to assess the effects of Q Pedagogy on ESOL undergraduates' level of reticence and subscription of reticent beliefs. Principally, interventionist study is similar to experimental design as both deal with deliberate change on individuals using a specific treatment or intervention. Nonetheless, one key distinctive feature of intervention research is that it involves less control over variables than experimental studies, which Brumfit and Mitchell (1990) argue that it could minimise the risk of "stopping class from being at all typical" (p. 12). Unlike interventionist study, experiment studies often involve a 'control group' of learners who do not receive special treatment, which could cause their behaviour to be different from their 'experimental group' counterparts. Thus, this paper argues that adopting an experimental design for the present study would not be effective as it violates with some logical and methodological considerations for remediation of reticence such as selection of participants and data collection.

### 3.2 Research Participants and Context

The present study was conducted on an intact group of undergraduate students undertaking an ESOL course in a Malaysian comprehensive university. Prior to the study, 31 students in the intact group took a diagnostic test using the Reticence Scale-12 (RS-12) (Kelly et al., 2007). Based on the test result, 14 students were identified as 'high reticent' in classroom oral participation, and they were chosen as the targeted research participants. In this study, all the participating students, with various degree of reticence, stayed in an intact group ever since their enrolment into the programme, so that the classroom atmosphere and the student learning behaviour could be kept as 'natural' as possible. This is what Brumfit and Mitchell (1990) termed as "the setting is the normal one for teaching and learning" (p. 12). This is extremely important for an interventionist study that concerns students' class oral participation because

authenticity of data could be ensured when the class interaction remained in an authentic setting.

### 3.3 Implementation of Q pedagogy

In an introductory session (Phase 1), an overview of the Q sorting activity was introduced to the students, which includes guiding the students to download and install the Q-sorting software (Lloyd's Q Sort Tool). This was followed by a trial Q sort activity on a topic that is familiar to the students – 'favourite countries'. The activity began with a pre-discussion task, in which the students were asked to respond to an open-ended guiding question related to the topic. The instructors then finalised the list of responses by eliminating any repeated responses. Following this, the final list of responses, which represented the whole class's 'voices', was input into the Q-Sort Tool and a sorting activity was created for the students. On the day of discussion, the sorting results, which were auto generated using factor analysis principles, were shown in the class. This allowed all the students to view (un)correlated responses among them. This was followed by a series of in-depth student-led group discussions. To do this, the students were grouped and regrouped following various correlation results generated. Via this approach, the students were able to discuss the targeted topic with peers who held similar and different views. The purpose of conducting this trial activity was aimed to acquaint the students with both the Q sort activity and the Q Sort Tool.

For the actual activity (Phase 2), the above procedures were repeated with topics covered in the learning units of the core course. Following the same procedure, after completing the Q-sort activity based on the students' responses, a full Q analysis which included a factor analysis on the students' Q sort responses was performed using the software and the results were used as the basis of group and class discussion.

To summarise, the Q sort was employed to assess students' subjectivity and decision-making abilities. The Q sort consists of a set of statements related to decision-making in the classroom and subjectivity. The students ranked the statements, for instance, based on their level of agreement, disagreement, or neutrality. The Q Sort software allows instructors to create, administer, and analyse Q-sorts, as well as generate reports and graphs for subsequent class discussion activity.

### 3.4 Instruments, data collection and analysis

A self-report measure, the Reticence Scale-12 (RS-12) (Kelly et al., 2007) was employed to gauge the students' tendency of being reticent in classroom oral participation before and after implementing Q pedagogy, or to assess the extent to which a student is experiencing high or low level of reticence in the classroom. The RS-12 consists of twelve items measuring level of reticence along six dimensions (e.g. feelings of anxiety, knowledge about topics, timing skills, organization of thoughts, delivery skills, and memory) on a 5-point Likert scale. The total score of the RS reveals a student's tendency to be reticent, with the higher the score indicating the more reluctant the student in oral participation, and vice versa (Soo & Goh, 2017). For analysis, the RS scores were tabulated using the 'ntile method' of ranking cases (De Vaus, 2002), which resulted in three ranked tertiles of 'level of reticence', namely low reticent, mid reticent and high reticent. With this method, students who experienced high level of reticence could be ascertained.

Besides the RS, the Reticent Belief Index (RBI) (Keaten et al., 2000) was employed to assess the extent to which the students who were diagnosed as 'highly reticent' subscribed to beliefs associated with reticence before and after the implementation of Q pedagogy. The RBI used in

this study was an enhanced version with an additional 'negative kiasu-related' reticent belief, which was framed as 'I can't compete with others if I share all my knowledge in class' (Soo & Goh, 2020). The index uses a five-point Likert scale to measure the students' agreement towards 17 statements.

To investigate whether there was a significant difference in the students' reports of subscription of reticent beliefs and level of reticence, Wilcoxon signed-rank test was used to compare the RS and RBI scores before and after the intervention. Unlike paired samples t-test, the Wilcoxon signed rank test, which is a non-parametric test, could be applied without any assumption that the populations are normally distributed, and it is suitable for the analysis of ordinal data (Akeyeda et al., 2014).

At the end of the project, a feedback questionnaire was administered to capture the students' perceptions towards Q sorting experience. The items were adapted from Rieber et al. (2022). Some of the items asked for general impressions of the Q sort activity (e.g., enjoyment, learning reflection) and some asked more specific questions about the pedagogical approach used (e.g., responding to the one-item survey/ submitting response, the use of the software, and completing the Q sort in class).

## 4. Results

### 4.1 Effect of Q Pedagogy on Students' Level of Reticence

Wilcoxon signed-rank test was used to examine whether there was any difference in the students' reticence scores before and after the intervention.

**Table 1: Ranks of students' reticence score after remediation**

| | | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| reticence score after remediation – reticence score before remediation | Negative Ranks | 11 | 7.91 | 87.00 |
| | Positive Ranks | 2 | 2.00 | 4.00 |
| | Ties | 1 | | |
| | Total | 14 | | |

Negative rank: reticence score after remediation < reticence score before remediation
Positive rank: reticence score after remediation > reticence score before remediation
Ties: reticence score after remediation = reticence score before remediation

**Table 2: Statistical difference of reticence scale scores among high reticent students**

Test Statistics[a]

| | Reticence score after intervention – Reticence score before intervention |
|---|---|
| Z | -2.906[b] |
| Asymp. Sig. (2-tailed) | .004 |

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

### 4.2 Effect of Q Pedagogy on Reticent Belief Change

Given the association between reticent beliefs and the students' reticent behaviour in oral participation, the investigation into the high reticent students' beliefs found that the majority of them appeared to hold some of the beliefs associated with reticence. Table 3 below displays the distribution of responses on the degree of agreement towards the seventeen beliefs by the high reticent students before intervention. Consistent with the data yielded by the RBI, it is

evident that majority of the high reticent students subscribed to eight faulty beliefs which were deemed associated with reticent behaviour.

**Table 3: Percentage of agreement with reticent beliefs by high-reticent students before intervention (N=14)**

| Reticent Beliefs (RB) | Percentage (%) | | | |
|---|---|---|---|---|
| | Strongly disagree | Disagree | Agree | Strongly agree |
| 1. It is better to remain silent than to look foolish in front of others. | - | - | 57.1 | 42.9 |
| 2. I can speak whenever I want to but I would rather listen. | - | 14.3 | 57.1 | 28.6 |
| 3. Being a good listener is more important than being a good speaker. | - | 14.3 | 64.3 | 21.4 |
| 4. Good communicators speak spontaneously. | - | 14.3 | 71.4 | 14.3 |
| 5. In general, people talk too much in class. | 7.1 | 14.3 | 42.9 | 35.7 |
| 6. I have more to gain by remaining silent than by talking in class. | - | 28.6 | 50.0 | 21.4 |
| 7. Being a good communicator has little to do with achieving your goals in learning. | 14.3 | 21.4 | 35.7 | 28.6 |
| 8. Excellent speakers are born not made. | - | 50.0 | 35.7 | 14.3 |
| 9. Skillful speaking is a form of manipulation. | 14.3 | 50.2 | 21.4 | 14.3 |
| 10. Speaking is not that important to me. | 28.6 | 42.9 | 21.4 | 7.1 |
| 11. I can't compete with others if I share all my knowledge in class. | 21.4 | 64.3 | 14.3 | - |
| 12. Communication skills cannot be taught; you either have them or you don't. | 42.9 | 57.1 | - | - |
| 13. Nervousness about speaking in class is normal. | - | - | 14.3 | 85.7 |
| 14. Communication is the process by which we form our identity. | 7.1 | 14.3 | 50.0 | 28.6 |
| 15. The most effective communicators are people who can adapt to their audience and the situation. | - | 12.3 | 35.7 | 50.0 |
| 16. It is through communication that we are able to build close relationships with others. | - | 21.4 | 28.6 | 50.0 |
| 17. I am a good listener. | - | - | 35.7 | 64.3 |

Among these, six reticent beliefs were rated with more than two-thirds of agreement by the students. Topping the list was RB-1, "It is better to remain silent than to look foolish in front of others". This was followed by the beliefs "I can speak whenever I want to but I would rather listen" (RB-2), "Being a good listener is more important than being a good speaker" (RB-3), "Good communicators speak spontaneously" (RB-4), "In general, people talk too much in class" (RB-5), and "I have more to gain by remaining silent than by talking in class" (RB-6). Other reticent beliefs were "Being a good communicator has little to do with achieving your goals in learning" (RB-7), and "Excellent speakers are born not made" (RB-8).

To analyse the intervention effects of Q pedagogy on the students' reticent belief change, the eight reticent beliefs subscribed by the reticent students were selected for further analysis following Keaten, Kelly and Finch's (2000) 2-way data analysis procedure. Similar to the analysis on level of reticence, Wilcoxon signed-rank test was used to analyse if there was any change in the students' reticent belief scores for the eight reticent beliefs they subscribed.

Table 4 shows the results comparing the ranks of reticent belief score change among the students before and after the intervention. According to the results, four of the reticent beliefs

subscribed by the students showed 'negative ranks' which signifies that the reticent belief scores obtained after remediation was lower than the scores obtained before intervention. This also indicates that their agreement (or subscription to) towards these four reticent beliefs decreased after the intervention. Topping this list was reticent belief 3 'Being a good listener is more important than being a good speaker' which recorded 10 students with a lower reticent belief score. This is followed by reticent belief 7 'Being a good communicator has little to do with achieving your goals in learning', reticent belief 2 'I can speak whenever I want to but I would rather listen', and reticent belief 6 'I have more to gain by remaining silent than by talking in class'. However, the remaining four reticent beliefs (beliefs 1, 4, 5, 8) showed no change in the scores (refer to number in 'ties'). This result implies that the intervention did not help them to modify these four beliefs.

**Table 4: Ranks of high reticent students' reticent belief change after intervention**

| | | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| belief score_after 1 - belief score_before 1 *(It is better to remain silent than to look foolish in front of others)* | Negative Ranks | 3 | 2.00 | 6.00 |
| | Positive Ranks | 0 | .00 | .00 |
| | Ties | 11 | | |
| | Total | 14 | | |
| belief score_after 2 - belief score_before 2 *(I can speak whenever I want to but I would rather listen)* | Negative Ranks | 8 | 4.50 | 36.00 |
| | Positive Ranks | 0 | .00 | .00 |
| | Ties | 6 | | |
| | Total | 14 | | |
| belief score_after 3 - belief score_before 3 *(Being a good listener is more important than being a good speaker)* | Negative Ranks | 10 | 6.80 | 68.00 |
| | Positive Ranks | 2 | 5.00 | 10.00 |
| | Ties | 2 | | |
| | Total | 14 | | |
| belief score_after 4 - belief score_before 4 *(Good communicators speak spontaneously)* | Negative Ranks | 6 | 4.17 | 25.00 |
| | Positive Ranks | 1 | 3.00 | 3.00 |
| | Ties | 7 | | |
| | Total | 14 | | |
| belief score_after 5 - belief score_before 5 *(In general, people talk too much in class)* | Negative Ranks | 3 | 2.00 | 6.00 |
| | Positive Ranks | 0 | .00 | .00 |
| | Ties | 11 | | |
| | Total | 14 | | |
| belief score_after 6 - belief score_before 6 *(I have more to gain by remaining silent than by talking in class)* | Negative Ranks | 7 | 4.00 | 28.00 |
| | Positive Ranks | 0 | .00 | .00 |
| | Ties | 7 | | |
| | Total | 14 | | |
| belief score_after 7 - belief score_before 7 *(Being a good communicator has little to do with achieving your goals in learning)* | Negative Ranks | 9 | 6.11 | 55.00 |
| | Positive Ranks | 2 | 5.50 | 11.00 |
| | Ties | 3 | | |
| | Total | 14 | | |
| belief score_after 8 - belief score_before 8 *(Excellent speakers are born not made)* | Negative Ranks | 3 | 2.00 | 6.00 |
| | Positive Ranks | 0 | .00 | .00 |
| | Ties | 11 | | |
| | Total | 14 | | |

Negative rank: belief score_after < belief score_before; Positive rank: belief score_after > belief score_before; Ties: belief score_after = belief score_before

Besides the results demonstrated in the ranks table above, examining the test statistics (Table 5) help to discover whether students' reticent beliefs change, due to the intervention of Q pedagogy, led to a statistically significant difference in reticent belief scores.

**Table 5: Statistical difference of reticent belief scores among high reticent students**

| | Z | Asymp. Sig. (2-tailed) |
|---|---|---|
| belief score_after 1 - belief score_before 1 | -1.732[b] | .083 |
| belief score_after 2 - belief score_before 2 | -2.828[b] | .005 |
| belief score_after 3 - belief score_before 3 | -2.392[b] | .017 |
| belief score_after 4 - belief score_before 4 | -1.933[b] | .053 |
| belief score_after 5 - belief score_before 5 | -1.633[b] | .102 |
| belief score_after 6 - belief score_before 6 | -2.530[b] | .011 |
| belief score_after 7 - belief score_before 7 | -2.138[b] | .033 |
| belief score_after 8 - belief score_before 8 | -1.732[b] | .083 |

a. Wilcoxon Signed Ranks Test; b. Based on positive ranks

The four reticent beliefs which showed 'negative ranks' in the rank table above also recorded a statistically significant difference in reticent belief scores after remediation. Examining the 'Asymp. Sig. (2-tailed)' value or the p-value of the test clearly shows that the application of Q pedagogy in the class elicited a statistically significant change in the students' reticent beliefs scores. The significant changes of the four reticent beliefs were: reticent belief 2 'I can speak whenever I want to but I would rather listen' ($Z = -2.828$, $p = 0.005$); reticent belief 6 'I have more to gain by remaining silent than by talking in class' ($Z = -2.530$, $p = 0.011$); reticent belief 3 'Being a good listener is more important than being a good speaker' ($Z = -2.392$ , $p = 0.017$) and reticent belief 7 'Being a good communicator has little to do with achieving your goals in learning' ($Z = -2.138$, $p = 0.033$).

Thus far, the results presented here provide some supports for the effectiveness of the intervention in changing students' reticent beliefs. The data shows that the significant changes of reticent beliefs lie in the students' awareness towards a balanced emphasis between listening and oral participation in class. Instead of believing that listening is more advantageous than speaking, the students, after going through the intervention, were more likely to acknowledge that oral participation in class is also equally important.

On the other hand, significant changes were not found on two reticent beliefs which obtained high percentages of agreement prior to remediation. First, while the pre-remediation results found that more than two-thirds of the students tend to maintain the belief that "It is better to remain silent than to look foolish in front of others", the remediation effect for this belief only obtained significance of 0.083. This result was consistent with the Keaten, et al. (2000) study in which they similarly obtained non-significant treatment effect for this belief using rhetoritherapy approach. The second belief was "Good communicators speak spontaneously". The intervention effect for this belief was equally weak. Thus, further study is needed to examine these two beliefs and figure out intervention techniques to alter them.

### 4.3 Students' Perceptions of the Q-sort Activities

After the whole-class discussion, the students were invited to complete a feedback survey to give their opinions of the Q sort activity, experience in the sorting activity and participation in class discussions. These results are shown in Table 6 below.

**Table 6: Students' views towards the Q-sort app and activity (n=31)**

| | Statements | Frequency and percentage | | | |
|---|---|---|---|---|---|
| | | Strongly disagree | Disagree | Agree | Strongly agree |
| 1. | The Q-sort app is easy to use. | - | - | 5 (16.1%) | 26 (83.9%) |
| 2. | I enjoyed participating in this sorting activity. | - | 1 (3.2%) | 13 (41.9%) | 17 (54.9%) |
| 3. | The sorting activity helped me to learn about the topic. | - | 3 (9.7%) | 19 (61.3%) | 9 (29.0%) |
| 4. | The sorting activity gives me a chance to express my views on a given topic. | - | - | - | 31 (100.0%) |
| 5. | My views or opinions on a given topic is valued or appreciated in the Q-sort activity. | - | - | 20 (64.5%) | 11 (35.5%) |
| 6. | The Q-sort activity helps me to contribute to class discussion in a different way. | - | - | 3 (9.7%) | 28 (90.3%) |
| 7. | Submitting my own response on the topic prior to completing the sorting activity helps to participate in class discussion. | - | 2 (6.5%) | 23 (74.2%) | 6 (19.3%) |
| 8. | Sorting the statements which represent various opinions from my classmates helps me to participate in class discussion. | - | - | 18 (58.1%) | 13 (31.9%) |
| 9. | Reviewing of the sorting activity results provided by the instructor allows me to participate in the class discussion. | - | - | 22 (71.0%) | 9 (29.0%) |
| 10. | The use of the Q-sort app helps me to participate in class discussion. | - | 2 (6.5%) | 16 (51.6%) | 13 (41.9%) |

As shown in Table 6, the students responded favourably to the Q-sort app, Q-sort task and to the overall instructional activities conducted. Overall, they perceived that the Q-sort app (or Lloyd's Q Sort Tool) was easy to use (statement 1), and it had also helped them to participate in class discussion (statement 10). Most importantly, all of them agreed that their views or opinions on a given topic were valued or appreciated through the Q-sort activity (statement 5). This is confirmed when they also unanimously and strongly agreed that the activity had given them a chance to express their views on a given topic (statement 4).

Additionally, when analysing their perceived helpfulness of the Q-sort activity, they unanimously expressed their strong agreement that the activity had helped them to contribute to class discussion in a different way (statement 6). This is further confirmed when nearly all of them also agreed that the various strategies applied in the Q-sort activity helped them to participate in class discussions such as submitting their own responses on the topic prior to completing the sorting activity (statement 7), sorting the statements which represent various opinions from my classmates (statement 8) and reviewing the sorting activity results (statement 9). Additionally, they also agreed that the Q-sort activity was both interesting and helpful in their understanding of a given topic.

## 5. Discussion

The aim of the study is to explore the feasibility of Q pedagogy in helping students express their views on a given topic in a safe and constructive learning environment. Results of this study yield insights to both the research questions as to whether the Q sort activity conducted in the class could help enhance students' participation, and the subsequent research question on the effects of Q pedagogy on modifying students' level of reticence and subscription of reticent beliefs.

In tertiary education, classrooms are filled with diverse subjective experiences for instructors and students (Rieber, 2020). There is no doubt that students come to class with diverse subjective views on various issues. These views are shaped by their exposure to the range of narratives they encounter in dynamic, complex, and ever-changing contexts (Lundberg et al., 2020). In line with this, student subjectivity is viewed as a rich source for learning. As Rieber posits, when students engage in self-reflection on their own subjectivities while acknowledging others' diverse perspectives, it helps to spark their interest and curiosity to learn. Thus, many disciplines in higher education expect their students to learn how to form, defend and negotiate views while engaging with others, which allows them to go beyond merely learning the subject matter. As a result, to support and promote student subjectivity, instructors need to improve their instructional strategy by engaging their students on a personal level with course content as well as to be able to assess conceptualization of key course themes (Rieber, 2020). On this note, eliciting and managing student subjectivity in the classroom has certainly become an issue that needs to be addressed since many students are reticent to share their viewpoints in class.

One of the challenges frequently faced by instructors is to inspire and assess a fruitful discussion (Rieber et al., 2022). This becomes even more challenging when there are reticent students who are reluctant to participate at all or very minimally in class. It is a common view that discussion value is often assessed based on student participation, and the criteria employed to judge the discussion quality relies solely on the participation frequency. This commonly accepted norm is deemed unfair to those students who feel uncomfortable voicing their point of view, especially when those views have already been expressed most vocally by a few students in class. In line with this, Q pedagogy or the Q sort activity is proposed to address this concern.

Via this approach, various statements that represented all the students' subjective views on a topic were compiled and presented in the Q sort activity. The biggest value of this instructional strategy is that the students could immediately see that their voice was acknowledged and represented in this group of statements. Furthermore, the sorting task itself forced all students to assess all the compiled points of view in the class. Unlike traditional class discussion which is frequently dominated by the active group of students, Q sort procedures force "the inclusion in discussion of all students, regardless of interest or major and places value on their perspective of the key concepts and major theme of the course." (Rieber et al., 2022, p.30). Following the theoretical perspective of Social Constructivism that underpins the concept of Q-methodology, when students involve in a Q-sort activity, they are driven to construct their understanding of a set of statements compiled based on their own voices and interpret them through their personal frame of reference before sorting them on a grid using the Q-sort app (Watts & Stenner, 2012). This, in a way, puts all the students in participation mode in class and promotes a richer class discussion. This is confirmed in the post-sort survey when the majority of the students perceived that the Q-sort activity helped them to contribute to class discussion via various strategies employed in the Q pedagogy.

The influence of belief systems on reticent individuals' reluctance to communicate behaviour has been theorised in the conceptualization of reticence (Keaten & Kelly, 2000; Phillips, 1984). Previous studies investigating reticent beliefs (Keaten et al., 2000; Soo & Goh, 2017) found that many reticent students did subscribe to some faulty or negative beliefs which caused them to behave reticent at various degrees. Hence, given the effect of reticent beliefs on students' willingness to participate in class discussion, and that these beliefs could be shifted (Keaten et al., 2000), this study examined how far these beliefs changed among the students as the result of the intervention.

The results demonstrated that four of the eight reticent beliefs subscribed by them not only showed 'negative ranks' but also a statistically significant difference in the reticent belief scores. These four reticent beliefs were 'I can speak whenever I want to but I would rather listen', 'I have more to gain by remaining silent than by talking in class', 'Being a good listener is more important than being a good speaker' and 'Being a good communicator has little to do with achieving your goals in learning'. This shows that the reticent students' subscriptions to these four reticent beliefs had decreased after undergoing the intervention. A plausible explanation for the reduction of agreement to these reticent beliefs could be attributed to the students' increased sense of controlling their irrational mindsets towards oral participation in class. Besides, the intervention results also revealed that the changes to the students' three reticent beliefs were related to listening. Before the intervention, many of them highly valued the role as listeners, and subsequently devalued the role of oral contribution in class. This shows that they began to realise the equal importance of both listening and oral participation in class discussion. These results further suggest that Q pedagogy could not only cultivate an inclusive student voice in class but also provide high value in cognitive modification.

It is important to note that a Q-sort may seem to be just another class survey seeking students' feedback on some topics. For this, some might argue that why not the instructors just use other forms of survey such as the Likert-type survey. As comparison, a typical Likert-type survey allows class scores to be calculated for 'individual' questions or statements, whereas the entire Q sort completed by student is the single data point. The Q sort activity outputs allow one to interpret a student's opinion about one statement while considering their opinion about all the statements. In addition, with the assistance of the app, Q-sort allows student subjectivity to be presented in a statistic data-based format which in a way foster evidence-based critical thinking among the students. Overall, the feedback survey responses glaringly show that the application of this approach in the class had created an inclusive learning environment where the students felt safe to express their thoughts and opinions. To conclude, the uniqueness of this instructional strategy lies in the way students' subjective views are collected, analysed, reported back to them, and the use of the sorted views for open class discussion.

## 6. Conclusion

Eliciting subjectivities or diverse opinions from students in ways that can lead to constructive classroom discussions has always been a daunting task to many instructors. This is even more challenging for instructors to make ways for students to have opportunities to share their views in fair and balanced manner (Rieber, 2023). This is because traditional class discussions only benefit students who can adopt active participatory behaviour, which subsequently puts the reticent students on the losing side as they can't participate actively like their counterparts. In relation to this, Q pedagogy emerged and has been suggested a potential solution to address these challenges. Nonetheless, despite its potential benefits, research on Q pedagogy is still at its early stage. Therefore, the present study was undertaken to investigate the feasibility of Q pedagogy in enhancing student participation and alleviating level of reticence and subscription of reticent beliefs in a university teaching context. The results of this study reveal that the students were able to provide and assess all subjective views generated in the class on the given topic using the Q-sort app. Also, the students expressed their interest and perceived that the Q-sort activity had helped them to contribute to class discussion. Finally, it is important to emphasise that the effects of Q pedagogy have direct implications for pedagogical practices that can promote student subjectivity and critical thinking in higher education. Nonetheless, further research is still required to explore the feasibility of Q pedagogy for other educational contexts.

**Acknowledgement**
The authors would like to acknowledge Universiti Malaysia Sarawak (UNIMAS) for the financial support via Scholarship of Teaching and Learning Research Grant (UNI/F09/SoTL-RG/85764/2023).

**Conflict of Interest Statement**
The authors declare that there is no conflict of interest regarding the publication of this study.

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