The Impact of Debate Lessons, Powered by Generative AI, on Student Learning

Seow Yongzhi
Ministry of Education, Singapore

Abstract

Humanities education in Singapore at the secondary level emphasises the inquiry-based learning pedagogical approach to engage students, inculcate critical thinking skills, and achieve the necessary knowledge and skills outcomes stipulated by the national curriculum. Inquiry-based learning is structured by a Humanities inquiry cycle involving four steps and can take various forms in the classroom. In this paper, I explore the use of debate as an active learning tool to enact inquiry lessons in Social Studies, framed by the inquiry cycle and leveraging Generative AI tools. I ran 5 debates for two Grade 9 classes comprising 79 students over two schooling terms (20 teaching weeks). Student speakers were assigned for each debate, and all students formed teams to do research with the help of AI tools such as Chat GPT and Microsoft CoPilot. Through student preparatory work, student survey data, and teacher observations, I find that debates are powerful devices to build excitement and spark joy amongst students but require a high degree of preparatory work and active student management by the teacher to achieve desired knowledge outcomes. As a teaching tool, debates can deepen reflection and foster critical thinking on specific topics, and debate lessons foster a positive learning environment that celebrate learning and improve student outcomes.

Keywords: debate, inquiry-based learning, Generative AI, social studies

The Humanities classroom is a space to encourage deep discourse and cultivate critical thinking amongst inquiring students and develop their interest in learning about society and the world around them. Topics in Humanities at the secondary level (Grades 7-10), contra those of the natural sciences, tend to be open-ended and encourage a wide range of perspectives, and are thus highly amenable to discursive frameworks such as debate and deliberation. In Singapore's secondary schools, Humanities education includes the disciplinary areas of History, Geography, Literature, Economics, and Social Studies.

This paper explores the use of debate as a teaching and learning tool for Social Studies in the Secondary 3 (Grade 9) classroom, as part of inquiry-based pedagogy, powered by Generative Artificial Intelligence (AI). The paper is organised as follows: the Literature Review introduces the subject of Social Studies in Singapore, the role of inquiry-based learning, and the promise of Generative AI; the Research Design outlines how the debate lessons were conceived and the collection of data to study the impact of these lessons; the Findings and Discussion provides analysis of the data in the context of extant research to answer the research question; and the Implications suggest how the paper's findings can contribute to policy, practice, and further research.

Literature Review and Theory

Social Studies is a compulsory half-unit subject, introduced in 2001. According to the syllabus document produced by the Curriculum Planning and Development Division (CPDD) of Singapore's Ministry of Education (MOE), Social Studies aims to develop students as "informed, concerned, and participative citizens" who can "understand the interconnectedness of Singapore and the world they live in … and appreciate the complexities of the human experience" (CPDD, 2023, p. 13). To this end, the syllabus is organised around three broad "Issues" based on the core concepts of "citizenship and governance", "identity and diversity", and "globalisation", which are then further partitioned into sub-topics to be taught and assessed (CPDD, 2023, p. 23–24). Broadly speaking, Social Studies as a subject inculcates conceptual understanding of society in Singapore and the world through the exploration of current issues, encourages students to analyse different viewpoints within varied sources of information to make informed judgments about the issue at hand, and simultaneously cultivates critical thinking and writing skills amongst students.

Inquiry-based learning is positioned as the central pedagogy for the teaching of Social Studies in Singapore at the secondary level. Inquiry-based learning is structured around an "inquiry cycle" (*Figure 7, in Appendix A*) that serves as a touchpoint for all Humanities public school teachers in Singapore. The cycle consists of four stages: sparking curiosity (through the inquiry question), gathering data (relevant to the inquiry question), exercising reasoning (analysis of the data), and reflective thinking (to form a considered judgement on the basis of data collected). This inquiry framework is consistently cascaded from government policymakers to public school teachers through a veritable range of communication mediums: from the syllabus documents written by the CPDD, to meetings and conferences hosted by "Networked Learning Communities" (NLCs), to courses and workshops run by CPDD and the Academy of Singapore

Teachers (AST). Through professional conversations and praxis, inquiry-based learning as structured by the four-stage inquiry cycle has become the *sine qua non* of Humanities education in Singapore.

Whilst the Singapore Ministry of Education's curriculum team centres the inquiry framework as a common approach for all Humanities teachers, the Ministry also encourages flexibility and divergent pedagogical practices by cautioning that "[inquiry-based] learning is not easily reduced to particular pedagogical strategies or techniques" (CPDD, 2023, p. 100). In other words, the broad inquiry-based approach may be prescribed, but specific teaching tools and techniques are left to the individual teacher's discretion. Inquiry is defined as a "classroom ethos" characterised by questioning techniques and student-centred learning. Students are ideally immersed in learning about and solving real-world problems through effective collaboration (Costes-Onishi et al, 2020). The teacher moves that facilitate such an experience include creating flexible and open classrooms that give students choices for their learning, stimulating student curiosity about the inquiry topic, and substituting teacher talk for student interaction and sharing (Murdoch, 2015). To this end, discussion-based lesson activities such as debate and deliberation are especially germane to the inquiry process.

How does inquiry-based teaching approaches affect student outcomes? Saunders-Stewart's review of the literature finds that extended inquiry-based learning can engender a positive attitude towards learning in Science-based disciplines (Ornstein, 2006; Saunders-Stewart et al. 2012, p. 20, citing Kyle, Bonnstetter, & Gadsden, 1988; Shymansky et al., 1983, 1990). Sima Aghazadeh's literature review of multiple empirical studies suggests that the strongest outcome of "inquiry-related" approaches in Humanities education is the improvement to student motivation, interest, and joy of learning (Aghazadeh, 2020, p. 25). Two studies are directly relevant to this paper's focus on secondary-level students (Grades 7-10) doing inquiry in the Humanities. One study, by Brush and Saye (2008), studied problem-based inquiry in history education. They collected data via classroom observation of 45 students in two Grade 11 history classes, as well as semi-structured interviews from 12 students and 2 teachers for the same classes. It reported high student engagement with the central problem as measured by classroom observations and the exit interviews (Brush & Saye, 2008, p. 36). One limitation of this study is that there is no baseline by which student engagement is measured against, meaning that no conclusion can be drawn on whether the inquiry-based approach is *more* effective at engaging students in comparison to non-inquiry-based approaches. Another study, by Summers and Dickinson (2012), conducted a longitudinal study on student outcomes in Social Studies at two US high schools. Using assessment data on social studies exams at Grades 8, 10, and 11, they found that "students who received PBI instruction significantly outscored the students who received traditional social studies instruction" (Summers & Dickinson, 2012, p. 97). The study is useful at providing evidence for the positive impact of inquiry-based approaches on student outcomes in the Humanities and can be augmented with data on the mechanisms by which such approaches achieve better student outcomes.

Debate is defined as an "organised public argument on a specific topic" (Shuster & Meany, 2005, p. 44). It is organised as an activity defined by rules of speaking and time limits, and

public in having an audience. Debate requires that speakers engage each other rationally through "argumentation and refutation, supported by reasoning, research, and evidence", and the element of refutation also requires speakers to listen and take notes from opponents. (Berek & Losos, 2014, p. 50). The positive impacts of debate on students include improving interest in the subject, knowledge outcomes, and communication skills. Berek and Losos, who conducted debate lessons for 8th grade students in the USA, remark: "Students who rarely open their mouths in class come alive. Students who are bored with the curriculum are challenged…" (Berek and Losos, 2014, p. 51), highlighting debate's power as a tool for differentiated instruction to achieve knowledge outcomes. Riyanda and Gunawan, who studied the effects of debate lessons on 11th grade students in Indonesia, find via qualitative and quantitative evidence that debate performs well as a tool for inquiry-based learning in cultivating higher order thinking skills such as analysis, evaluation, and creative thinking (Riyanda & Gunawan, 2018). However, conducting debate lessons has drawbacks: it is time-consuming for teachers to introduce the rules, students to do pre-debate research, and to run the debate lesson itself (Berek & Losos, 2014, p. 55). Additionally, the actual debate may not cover all the key learning points for the particular chapter which need to be taught in the syllabus. Consequently, the teacher needs to take more time consolidating students' learning, which may detract from the smooth delivery of the entire curriculum.

Can the challenge of high time demands facing debate lessons be resolved with the advent of Generative Artificial Intelligence (AI)? Generative AI, popularised with the introduction of Chat GPT in 2022, is characterised by the (i) use of deep learning models to generate human-like responses to (iii) complex and varied prompts (Lim et al., 2023, p. 2). Generative AI has been hailed as "transformative" and a tool of the "future of education" that brings about both opportunities and threats (Lim et al., 2023, p. 3). The key advantage of Generative AI is that it can rapidly source information and organise the information together in a coherent manner based on the prompt given by the user, although the information has varying levels of reliability and may not cite its sources. Drawbacks of Generative AI include potential misinformation, the provision of information for nefarious purposes, and its ability to confound assessment tools such as entrance exams for schools, workplaces, and professional qualifications (Lim et al., 2023). Specific to literacy and writing tasks for students in secondary schools, teachers warn that there is a danger that AI simply replaces rather than facilitates students' learning: "The use of AI technology, like any technology, should be used to support the writing process, rather than replace it" (Maher & Young, 2023, p. 128). Consequently, teachers need to implement strong pedagogical strategies and classroom routines to ensure that AI will complement and support students' learning, rather than substitute or supplant students' own work.

Nevertheless, it is undeniable that Generative AI has enormous potential to resolve chokepoints for complex lesson activities. In the case of debate lessons, Generative AI can simplify and shorten the preparatory process amongst students, which makes debate a more viable teaching tool within limited curriculum time. Debate is germane to the four-stage inquiry process: debate motions are framed around an inquiry topic, preparing the case is an exercise in gathering data,

the actual debate requires students to exercise reasoning, and the audience and adjudicators come to a final conclusion based on reflective thinking.

Research Design

Introduction to the Research Design

The research question investigates how debate impacts student learning in Social Studies. To evaluate the effectiveness of debate as an inquiry-based learning approach, I ran five debates for two Grade 9 classes, comprising 79 students, over two schooling terms (20 teaching weeks). The impact of this treatment was measured through student preparatory work, anonymous student surveys collecting data on student preferences, mechanisms for learning, and post-lesson behaviour, and teacher observations of student performance throughout the debates. Quantitative data was analysed through descriptive statistics, and qualitative data was analysed to make inferences on student interest and behavioural choices.

Planning the Debates

Curricular Planning

For debate lessons to fit within curriculum time, teachers must be cognisant of ends and means. Learning outcomes are drawn from the central syllabus document produced by the Singapore Ministry of Education's curriculum division, and then specified on a timeline by individual school subject departments' "Scheme of Work" (SOW). Teachers thus draw out the specific instructional objectives to be achieved, pick out relevant topics, and then frame the debate lessons to elicit the corresponding knowledge and skills outcomes (Table 6, in Appendix A).

Lesson Planning

I decided to use the *World Schools* debate format rather than the *British Parliamentary* debate format, in order for students to work in bigger teams for research and to sustain a coherent argument throughout the debate.[1] Planning a full cycle of a "debate lesson" involves (A) introducing the debate motion, (B) splitting the class into different teams: Proposition and Opposition, (C) giving students time and resources to do research on the debate motion, (D) conducting the student debate, and (E) consolidating student learning through assessment and feedback. Each step in preparing for the debate lesson mapped cleanly on the four-stage Humanities Inquiry Cycle.

[1] The World Schools debate format features two teams of speakers (Proposition and Opposition). Debate motions may be on principles or policy. There are three substantive speakers and one reply speaker on each team. The British Parliamentary debate format features four teams of speakers, based on the British Parliament (Opening Government, Opening Opposition, Closing Government, Closing Opposition). Debate motions are typically on policy. There are two speakers on each team.

Lesson Implementation

Lessons in the school are taught in periods of 35 minutes. For the first cycle of debate lessons, the debate format and topics were introduced to the students via a worksheet. All students were divided into teams. Students were introduced to ChatGPT and given sample prompts to feed into ChatGPT to generate a debate case for their team. The prompt worksheet can be found in the *Appendix B*. Each team wrote up a "debate preparation" sheet on Google Docs with the help of ChatGPT and picked members to be speakers for the student debate. A two-period lesson (1 hr 10 min) was allocated for the actual student debate, with selected students serving as the chairperson and timekeeper. Student *speakers* were at the front, and student *observers* watched as audience members and took notes on the debate. The teacher observed and tracked the debate and gave feedback to the teams via oral adjudication and the scribed notes.

In total, I implemented five cycles of debate lessons for two Grade 9 classes, which had 39 and 40 students (*Table 5, in Appendix A*). The first four debates were intra-class debates, and the fifth debate was an inter-class debate. The fifth debate motion was designed to be similar to the fourth motion to ensure familiarity and increase the quality of the inter-class debate.[2] The first cycle of debate lessons consequently took four teaching periods: one period for introduction to the debate format, one for preparation via Generative AI, and two for the actual student debate with a consolidation. Subsequent cycles of debate lessons would take two periods, as the preparation could be done as flipped learning. Consequently, the five debate cycles implemented took up 12 teaching periods across 20 teaching weeks. None of the debates were used for summative assessment, that is to say, students were not formally graded.

Collecting Data: Student Surveys, Student Work, and Teacher Observations

Student Surveys

To investigate the effects and efficacy of debate lessons, I designed a student survey to capture students' views of debate lessons in comparison with typical lessons. The survey was anonymised to reduce distortion from social desirability bias, but required students to indicate their class in order to increase participation rate. Survey responses were collected from 67 students in Secondary 3, from two classes of 79 students. Survey questions focussed on the student experience: whether they enjoyed the debate lesson (to assess efficacy in achieving joy of learning), whether it led to students discussing the topics after class (to assess efficacy in sparking curiosity), and what they learned from the debate lesson (to assess knowledge outcomes). Survey questions can be found in *Appendix C*.

Student Work

Evidence of student learning was assessed through the team preparation sheets (*Appendix B*), student survey responses (*Appendix C*), and the oral speeches delivered by students in the student debates.[2] Feedback was provided to students throughout the debate lesson cycle, including both process feedback on how to improve the use of Generative AI or how to speak

audibly and clearly, and substantive feedback on the students' written and oral arguments in relation to the desired knowledge outcomes.

Teacher Observations

Teacher colleagues were invited to observe the debate lessons. English, Humanities, and Form Teachers for the class were invited to view the debates and support their students. No formal feedback was collected. Nevertheless, colleagues' informal feedback, coupled with my own observations as the planner and teacher for each debate lesson cycle, added insight into the strengths, constraints, and pain points in using debate as a teaching tool for inquiry-based learning in Social Studies.

Findings and Discussion

Debate Lessons' Impact on Student Interest

Are debates effective at increasing students' interest in the topic, and by extension the Humanities subject (Berek and Lasos, 2014)? On the question to elicit joy of learning: *"Did you enjoy the debate lesson?"* on a linear scale of 1-5, with 1 being "Did not enjoy the lesson at all" and 5 being "Enjoyed the lesson tremendously", with 67 student responses, the median score is 4 and the mean score is 4.22 (*Figure 1*). We can subdivide the student responses between 36 student speakers and 31 student observers. The mean score for student speakers is 4 and student observers is 4.48 (*Table 1*). This positive finding provides substantial empirical support for Berek and Lasos' (2014) assessment that debates are a powerful tool for motivating and empowering learners in Humanities education.

Figure 1

Survey Results for Impact of Debate Lessons on Joy of Learning

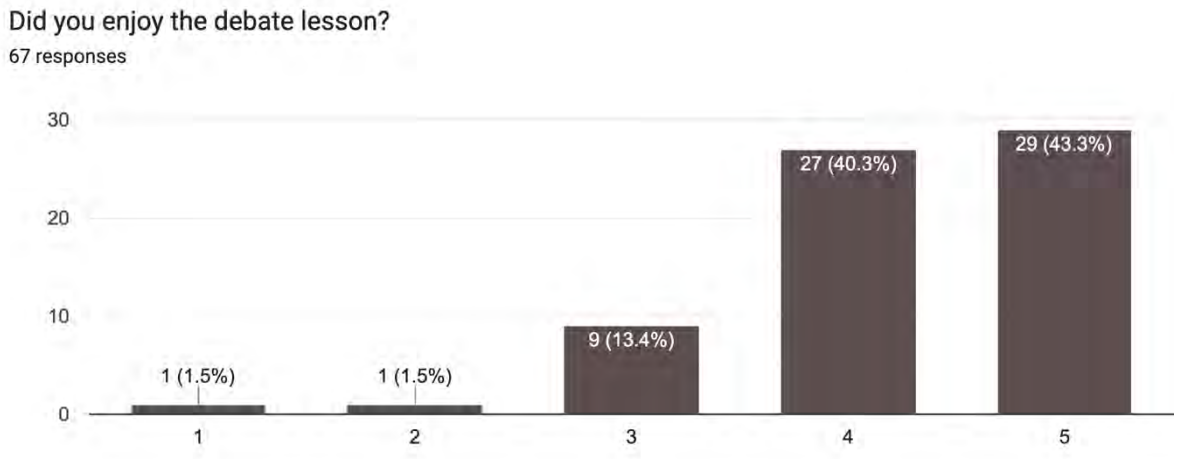


Table 1
Survey Results for Impact of Debate Lessons on Joy of Learning (Linear Scale)

Respondent Group	*Median Score*	*Mean Score*
All (n=67)	4.00	4.22
Speakers (n=36)	4.00	4.00
Observers (n=31)	4.00	4.48

The greater level of engagement for student observers is surprising, since we should expect that the positive impact of debate lessons in facilitating active learning is greater for student speakers. One plausible explanation is that student observers feel less performance stress and can more fully enjoy the lesson. Nevertheless, the finding that most students enjoyed the debate lesson, and this effect is stronger for observers, is doubly encouraging. It demonstrates that debate lessons can inculcate a strong joy of learning, and that student observers are not left out or disengaged as compared to student speakers.

Are debate lessons, based on the inquiry framework, *more* effective than non-inquiry based lessons? On the comparative question of whether students preferred the "normal" lesson or the "debate" lesson: *"Do you prefer the 'normal' lesson or 'debate' lesson?"*, on a linear scale of 1-5, with 1 being "Normal lesson is much better" and 5 being "Debate lesson is much better", with 67 student responses, the median score is 4 and the mean score is 3.97 (*Figure 2*). The mean score for 36 student speakers is 3.81 and for 31 student observers is 4.16 (*Table 2*). This positive result supports the hypothesis that an explicit inquiry-based approach succeeds at engaging students and immersing students actively in constructing their own knowledge (Costes-Onishi et al., 2020). Additionally, the above empirical evidence that inquiry-based debate lessons are *comparatively more engaging* than non-inquiry based lessons close the scholarly lacuna left by Brush and Saye (2008)'s study. The additional finding that student observers preferred debate lessons to a greater degree than student speakers may again reflect that student observers are under less performative pressure as compared to student speakers.

Figure 2

Survey Results for "Normal" versus "Debate" Lesson

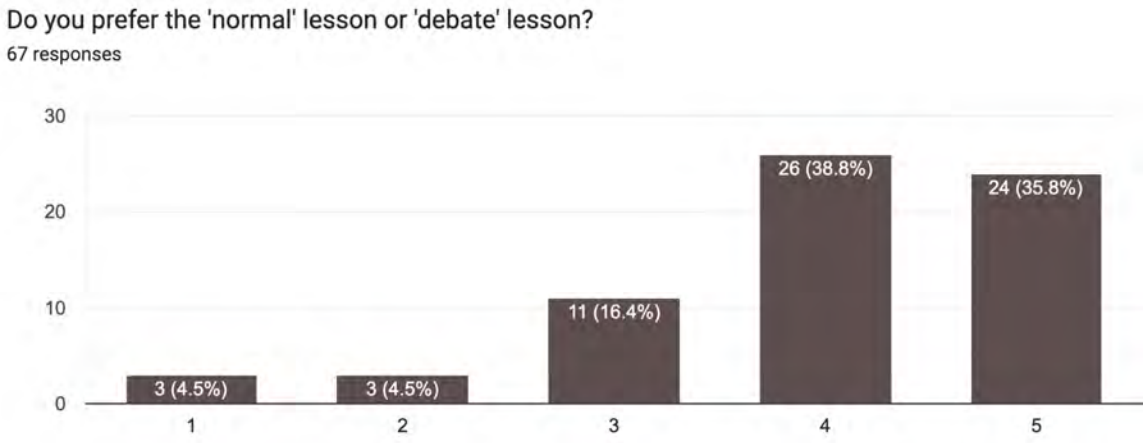


Table 2

Survey Results for "Normal" versus "Debate" Lesson (Linear Scale)

Respondent Group	*Median Score*	*Mean Score*
All (n=67)	4.00	3.97
Speakers (n=36)	4.00	3.81
Observers (n=31)	4.00	4.16

Why do students prefer either lesson type? The comparative question of "normal lesson" versus "debate lesson", on a linear scale, was followed up by an open-ended question, *"What makes you prefer a normal lesson OR a debate lesson? Explain your view briefly."* (*Table 7, in Appendix A*). Students who preferred "normal" lessons highlighted that "normal" lessons targeted the syllabus objectives more directly, whereas "debate" lessons can be stressful and might lead to personal disagreements between students. Conversely, students who preferred "debate" lessons emphasised the fun and interactive nature of debates, which increased collaboration between students and engagement with the topic.

On the question of whether the debate lesson had a lasting effect on student interest: *"Did you talk about your debate after the lesson with your parents or friends?"* on a linear scale of 1-5, with 1 being "I did not talk about the class debate at all" and 5 being "I shared a lot about the class debate with family and/or friends", with 67 student responses, the median score is 3 and the mean score is 2.79 (*Figure 3*). The mean score for 36 student speakers is 3.19 and for 31 student observers is 2.32 (*Table 3*). Generally, results for lasting effect are weaker and more mixed compared to the interest sparking during the lesson itself, which suggests that interest in the topic after the debate lesson atrophies rapidly. This is not surprising since secondary school students take a large number of academic subjects and are also involved in extracurricular activities and other social engagements. Intriguingly, for this question, the scores for student

speakers and student observers are reversed: debate lessons have a *greater lasting impact* on student speakers, who report being more likely to talk about the debate lesson with parents and friends. This is expected, since student speakers are more invested in the debate itself and the outcomes of the debate, and likely had a more intense learning experience.

Figure 3

Survey Results for Lasting Effect of Debate Lessons on Student Interest

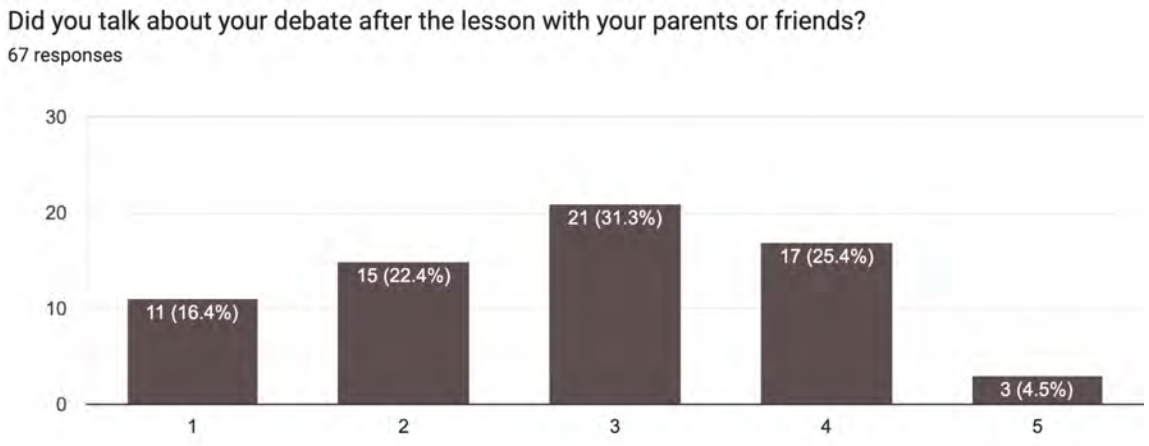


Table 3

Survey Results for Lasting Effect of Student Interest (Linear Scale)

Respondent Group	*Median Score*	*Mean Score*
All (n=67)	3.00	2.79
Speakers (n=36)	3.00	3.19
Observers (n=31)	3.00	2.32

Finally, on the question of whether students were motivated to learn more about the topic in the syllabus: *"How motivated are you to find out more about [Social Studies] Chapter 2: Functions and Role of Government after the debate lesson?"*, on a linear scale of 1-5, with 1 being "Not motivated" and 5 being "Very motivated", with 67 student responses, the median score is 4 and the mean score is 3.85 (*Figure 4*). The mean score for 36 student speakers is 3.83 and for 31 student observers is 3.87 (*Table 4*). Most students report a greater interest in learning more about the relevant content chapter within the subject syllabus. This supports the argument provided by Berek and Lasos (2014) that inquiry-based learning propels stronger student outcomes by dint of boosting interest, with the causal mechanism that students who are more interested in the subject matter invest time and effort to retain and extend their knowledge about the subject even after the lesson.

Figure 4

Survey Results for Impact of Debate Lessons on Student Willingness to Learn More

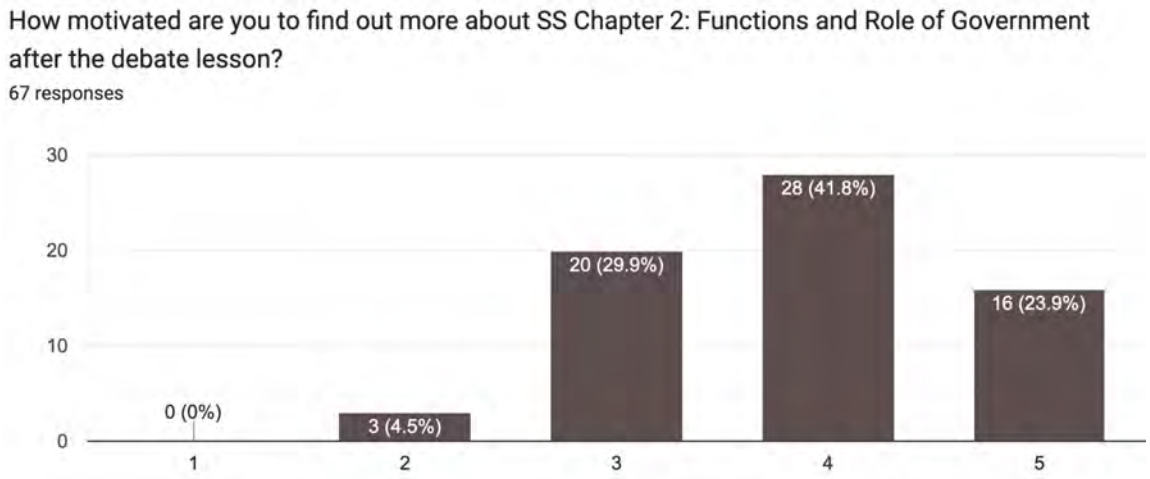


Table 4

Survey Results for Impact of Debate Lessons on Student Willingness to Learn More (Linear Scale)

Respondent Group	*Median Score*	*Mean Score*
All (n=67)	4.00	3.85
Speakers (n=36)	4.00	3.83
Observers (n=31)	4.00	3.87

In sum, the survey results demonstrate that debate lessons have a powerful effect in cultivating student interest, sparking the joy of learning, motivating students to share their learning and find out more. Student observers, having the less stressful task, reported being happier with the debate lessons and wanting more of the same relative to student speakers, and remarkably were just as engaged and enthused as the student speakers. However, the debate lessons had a deeper and more lasting impact on student speakers, who were more motivated to share their experiences from the debate to family and friends after the lessons. Survey results are unlikely to be seriously affected by social desirability bias as the student survey was run anonymously with no identifying information collected.

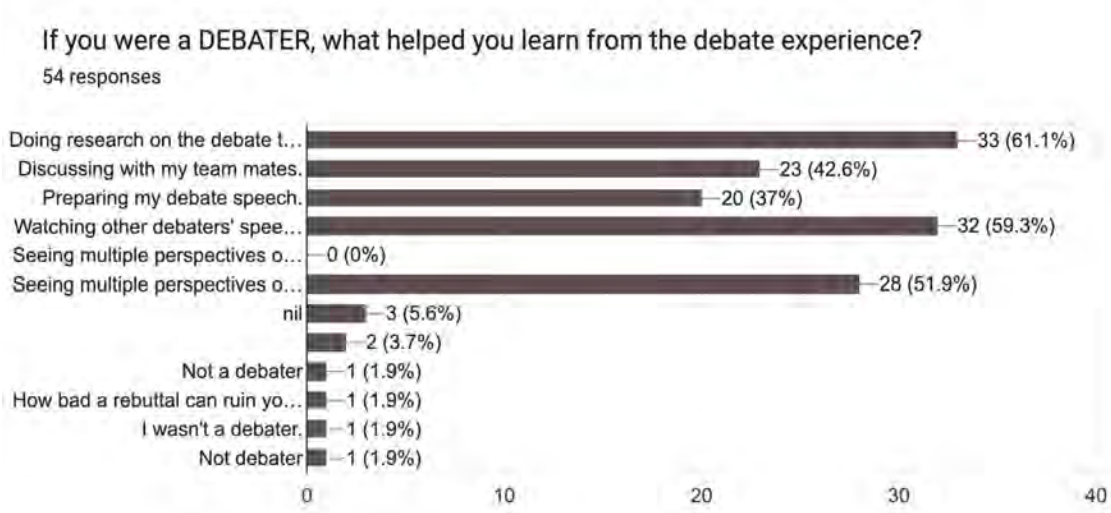
Debate Lessons' Impact on Student Learning

Summers and Dickinson (2012) conclude through their analysis of longitudinal data that problem-based inquiry learning can improve student outcomes and posit that these salutary effects arise through "global connections and real–work aspects" (Summers & Dickinson,

2012, p. 85). Their study did not test the hypothesis. Is this the only mechanism by which inquiry might boost student learning? The survey asked student speakers what helped them learn best from the debate lesson, with various pre-set options provided. A majority of students agreed that the stronger mechanisms for learning were "Doing research on the debate topic" (61.1%), "Watching other debaters' speeches" (59.3%), and "Seeing multiple perspectives on one topic" (51.9%). The results are reported below (*Figure 5*).

Figure 5

Survey Results on What in Debate Lessons Helped Student Speakers to Learn



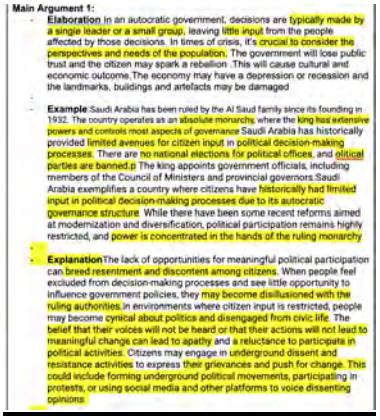
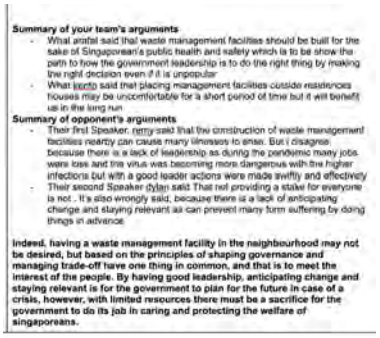
Preparation

These survey findings indicate that the preparation and research stage in the debate lesson cycle is important in building up students' knowledge. Students indicated doing research as the key component of their learning, even though the research was assisted by Generative AI tools, which suggests that AI can complement student learning when used in the right ways. This finding is especially reassuring in light of the concerns of Generative AI as *substituting for* rather than *complementing and supporting* student learning in the literature and popular media (Lim et al, 2023).

However, one important caveat is that student learning tapping on Generative AI is not uniformly distributed. Instead, whether AI improves and strengthens students' knowledge, or simply short-circuits students' thinking process, depends heavily on students' attitude towards learning. This is visible from the students' debate preparation sheets written up during the preparation stage of the debate lesson cycle. Some groups use Generative AI to deliver a first-cut of potential arguments for their debates before proceeding to refine those arguments and pick out good examples, whereas other groups simply had AI do all of the work and made minimal effort to refine and improve upon the AI product (*Figure 6*).

Figure 6

Variance in Student Preparation and Refinement Beyond AI Work

Minimal student refinement, wholly or mostly AI work	Some student refinement, largely AI work	Significant student refinement, beyond AI work
		

How did students refine and improve upon the AI product? At the basic level, students subdivided the AI points between their speakers and highlighted key points from the AI work. At the intermediate level, students also summarised the key points and anticipate opponents' arguments using AI, to construct a stronger case. At the maximal level, students prepared specific rebuttals for anticipated arguments, and also introduced their own examples based on the school experience – one student quoted from the school principal's speeches!

Debates

Five student debates were conducted for each Grade 9 class: four intra-class and one inter-class. This gave every student the opportunity to be on a team and allowed more than half of each class to have the opportunity to participate as a debate speaker. Student speakers and observers alike tracked the debate by taking notes, although only speakers were permitted to use their electronic "Personal Learning Device" (PLD) – a Google Chromebook provided for every student in the school. Every debate was tracked by the teacher, who gave feedback to the class via oral adjudication, and to the student speakers via written notes (*Figure 8, in Appendix A*). The final, inter-class debate was video-recorded and uploaded online as a celebration of the students' learning, and a resource for student revision.[2] None of the debates were used for summative assessment.

Concretely, what did students take away from the debate lessons? The survey responses indicate that students had learning points relating to process, knowledge, and skills outcomes (*Table 8, in Appendix A*). In terms of process, students opined that they learned what a debate was and how to do a debate. In terms of knowledge, students learned about the functions and roles of government in relation to the topics, such as "I learned what an autocratic government was an its examples" and "The government main role is not to only provide food for the people but to care for the citizens' needs, including hunger like preserving safety and security and

ensuring the wellbeing of citizens". The alignment of these takeaways to the syllabus knowledge outcomes reflects the design of debate motions meant to elicit research and thinking on the syllabus content. In terms of **skills**, students learned to collaborate in teams, make oral speeches to an audience, and think critically and flexibly to respond to opponents' arguments. Students also reflected on the nature of perspective-taking, and realised that different people may have different points of view and may reasonably disagree: "Everyone can have different opinions and reasons for how they think towards the same situation." Broadly speaking, both student speakers and observers had their own takeaways, although observers were much more likely to highlight audibility issues while speakers identified learning points relating to public speaking.

Constraints and Trade-Offs for Debate Lessons

One major constraint for debate lessons is the time constraint, as identified in the Literature Review and by the students themselves. Debate lessons narrow in on a specific topic and do not provide comprehensive coverage of the chapter. Hence, the trade-off in choosing to invest time in debate lessons is well-rounded student knowledge of the chapter. This trade-off is mitigated in three ways: (1) a clear teacher consolidation of the debate lesson to achieve the remaining knowledge outcomes from the chapter, (2) increased student interest in the subject that encourages them to do self-directed learning, and (3) flipped learning to allow students to learn the remaining material on their own.

Another constraint relates to the management of students' use of technology, such as their PLD and Generative AI. A student was caught using the AI to research irrelevant topics. While experimenting with AI can be encouraged, students should nevertheless be managed to stay on task during the lesson time. As we progressed with multiple debate lesson cycles, students became more familiar with routines relating to use of technology, which enabled them to stay on task more often to achieve the desired learning outcomes.

A third constraint relates to student collaboration. Some students report shouldering the burden of preparatory work while their team-mates coasted on their coattails or had difficulty selecting their student speakers when most of the group were not keen to present. While this can be partly managed by the teacher through a skilful assignment of student groups or imposing of logical consequences for slacking off, ultimately it falls to students themselves to develop effective communication skills and take ownership of their work.

Implications

Do student debates powered by Generative AI achieve better learning outcomes? This study has provided empirical evidence that inquiry-based debate lessons elicit greater student interest in the subject in contrast to non-inquiry-based lessons. for Humanities education. The study has also identified multiple mechanisms by which inquiry-based learning improves student outcomes: (1) Higher student interest creates a positive learning culture and improves students' motivation to study; (2) Preparatory work through research and discussion facilitates

perspective-taking and critical thinking; (3) Engagement in debate activities facilitates perspective-taking and critical thinking.

This study has clear implications for pedagogical policy and practice in Humanities education. For policymakers, this study provides support for inquiry-based learning as the central pedagogy for Humanities education in Singapore, as inquiry-based approaches can succeed in eliciting the joy of learning and improving student outcomes. For teachers, this study recommends integrating Generative AI with inquiry-based lessons, subject to careful management and clear routines to avoid pitfalls such as distractions from use of technology or substitution of critical thinking.

What are some angles for future research on the impact of inquiry-based learning on student outcomes? One approach is to delve more deeply into the mechanisms by which inquiry improves student outcomes: for example, by employing principal component analysis to identify causal mechanisms, or by employing multivariate regression and instrumental variable analysis to compare the relative efficacy of each mechanism. Another approach could be to investigate the difference between inquiry- and non-inquiry lessons more rigorously through experimental research designs. There is also further scope for studying the impact of debates on student learning beyond inquiry: by examining how debates can differentiate instruction by process and by product (Hall 2003; Tomlinson 2005; Tomlinson 2017), and how debates can promote “active learning” by centring the student as a self-directed learner throughout the process from research to delivery (Bonwell & Eison, 1991; Brame, 2016; Felder & Brent, 2009; Handelsmand & Pfund, 2007). In conclusion, debates and inquiry-based learning writ large are salutary approaches that enrich and enliven the Humanities classroom, and merit scholarly attention to uncover and understand their impacts.

Acknowledgement

The Humanities debate lessons were planned and implemented in a public secondary school in Singapore. The project was presented to the Humanities department of the school in March 2024, and refined based on valuable feedback and inputs from teacher colleagues.

References

Aghazadeh, S. (2020). *Inquiry-based learning and its impact on teaching and learning of the Humanities*. (NIE Working Paper Series No. 19). Singapore: National Institute of Education. Retrieved from https://nie.edu. sg/research/publication/nie-working-paperseries/working-paper-series-no-19

Bondie, R. S., Dahnke, C., & Zusho, A. (2019). How does changing "one-size-fits-all" to differentiated instruction affect teaching?. *Review of Research in Education*, *43*(1), 336–362. https://doi.org/10.3102/0091732X18821130

Bonwell, C. C., & Eison, J. A. (1991). Active learning: Creating excitement in the classroom. *1991 ASHE-ERIC Higher Education Reports*. ERIC Clearinghouse on Higher Education, The George Washington University.

Brame, C. (2016). *Active learning*. Vanderbilt University Center for Teaching.

Brush, T., & Saye, J. (2008). The effects of multimedia-supported problem-based inquiry on student engagement, empathy, and assumptions about history. *Interdisciplinary Journal of Problem-Based Learning*, *2*(1), 21–56. https://doi.org/10.7771/1541-5015.1052

Burek, D., & Losos, C. (2014). Debate: Where speaking and listening come first. *Voices from the Middle*, *22*(1), 49. https://doi.org/10.58680/vm201426063

Costes-Onishi, P., Baildon, M., & Aghazadeh, S. (2020). Moving inquiry-based learning forward: A meta-synthesis on inquiry-based classroom practices for pedagogical innovation and school improvement in the humanities and arts. *Asia Pacific Journal of Education*, *40*(4), 552–575. https://doi.org/10.1080/02188791.2020.1838883

Curriculum Planning and Development Division (2023). *SOCIAL STUDIES: TEACHING AND LEARNING GUIDE*. Ministry of Education (MOE), Singapore.

Felder, R. M., & Brent, R. (2009). Active learning: An introduction. *ASQ Higher Education Brief*, *2*(4), 1–5.

Hall, T., Strangman, N., & Meyer, A. (2003). *Differentiated instruction and implications for UDL implementation*. Wakefield, MA: National Center on Accessing the General Curriculum.

Handelsman, J., Miller, S., & Pfund, C. (2007). *Scientific teaching.* Macmillan.

Kyle, W. C., Jr., Bonnstetter, R. J., & Gadsden, T., Jr. (1988). An implementation study: An analysis of elementary students' and teachers' attitudes toward science in process-approach vs. traditional science class. *Journal of Research in Science Teaching*, *25*, 103–120. https://doi.org/10.1002/tea.3660250203

Lim, W. M., Gunasekara, A., Pallant, J. L., Pallant, J. I., & Pechenkina, E. (2023). Generative AI and the future of education: Ragnarök or reformation? A paradoxical perspective from management educators. *The international journal of management education*, *21*(2), 100790. https://doi.org/10.1016/j.ijme.2023.100790

Maher, D., & Young, K. (2023). Generative AI Technology to Support High School Students Experiencing Challenges With Writing. *What pre K-12 teachers should know about educational technology in 2023: A research-to-practice anthology*. Association for the Advancement of Computing in Education.

Murdoch, K. (2015). *The power of inquiry: Teaching and learning with curiosity, creativity and purpose in the contemporary classroom*. Seastar Education.

Ornstein, A. (2006). The frequency of hands-on experimentation and student attitudes toward science: A statistically significant relation. *Journal of Science Education and Technology*, *15*, 285–297. https://doi.org/10.1007/s10956-006-9015-5

Riyanda, W. B., & Gunawan, W. (2018). Incorporating debate into inquiry-based learning approach to improve the students' higher order thinking skills. *Edusentris, Jurnal Ilmu Pendidikan dan Pengajaran*, *5*(3). https://doi.org/10.17509/edusentris.v5i3.301

Saunders-Stewart, K. S., Gyles, P. D., & Shore, B. M. (2012). Student outcomes in inquiry instruction: A literature-derived inventory. *Journal of Advanced Academics*, *23*(1), 5–31. https://doi.org/10.1177/1932202X11429860

Shuster, K., & Meany, J. (2005). *Speak out!: Debate and public speaking in the middle grades*. IDEA.

Shymansky, J. A., Hedges, L. V., & Woodworth, G. (1990). A reassessment of the effects of inquiry-based science curricula of the 60s on student performance. *Journal of Research in Science Teaching*, *20*, 127–144. https://doi.org/10.1002/tea.3660270205

Shymansky, J. A., Kyle, W. C., Jr., & Alport, J. M. (1983). The effects of new science curricula on student performance. *Journal of Research in Science Teachin*g, *20*, 387–404. https://doi.org/10.1002/tea.3660200504

Summers, E. J., & Dickinson, G. (2012). A longitudinal investigation of project–based instruction and student achievement in high school social studies. *Interdisciplinary Journal of Problem-Based Learnin*g, *6*(1), 82–103. https://doi.org/10.7771/1541-5015.1313

Tomlinson, C. A. (2005). Differentiating Instruction: Why Bother?. *National Middle School Association* (NJ1), *9*(1), 12–14.

Tomlinson, C. A. (2017). *Differentiated instruction. In Fundamentals of gifted education* (pp. 279–292). Routledge. https://doi.org/10.4324/9781315639987-26

Corresponding author: Seow Yongzhi
Email: seow_yongzhi@moe.edu.sg

Appendices

Appendix A: Figures and Visuals

Figure 7

Inquiry-Based Learning Framework (CPDD, 2023, p. 98)

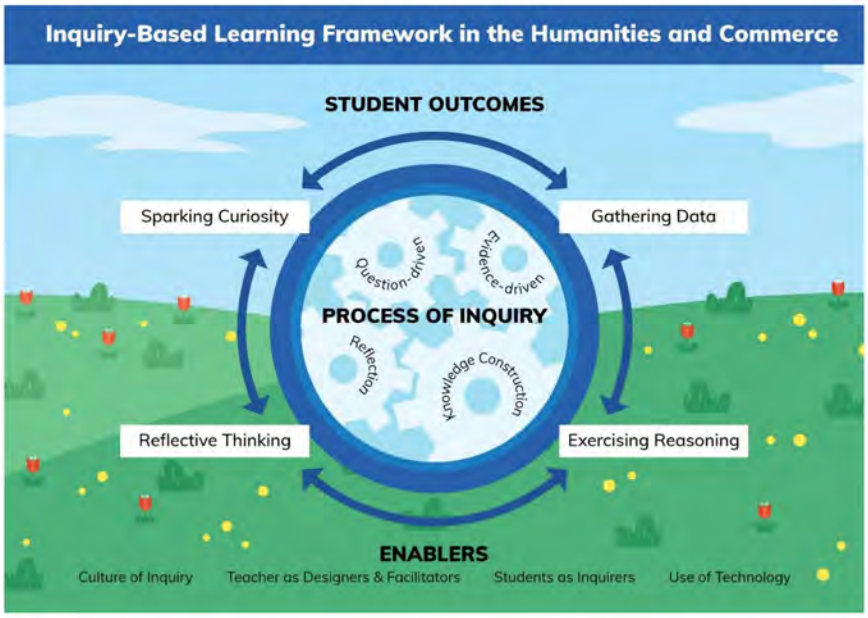


Table 5
Syllabus Objectives and Debate Motions (CPDD, 2023, p. 28)

Chapter in Social Studies Syllabus	*Knowledge Outcomes (Students will be able to understand:)*	*Core Concepts*	*Debate Motion*
2.1 Functions of government	The functions and roles of government in working for the good of society.	Functions of government • Makes and passes laws • Implements and enforces laws • Interprets and applies laws	(1) THBT It is better to have an autocratic government in times of crisis.
2.2 Roles of government		Roles of government • Maintains law and order • Ensures economic and social well-being of citizens • Promotes and protects a country's national interests	(2) THBT The Government's main role is to make sure no one goes hungry.
3.1 Challenges in deciding what is good for society 3.2 Managing trade-offs	The challenges of determining what is good for a society, with decisions guided by the principles of governance.	Challenges in deciding what is good for society • Differing needs and interests • Differing priorities • Unequal sharing of costs Managing trade-offs	(3) THBT The Government should build waste management facilities, regardless of objections from nearby residents.
3.3 Principles shaping governance	The challenges of determining what is good for a society, with decisions guided by the principles of governance.	Principles shaping governance • Having good leadership • Anticipating change and staying relevant • A stake for everyone, opportunities for all • Practising meritocracy	(4) THBT Meritocracy works well for Singapore's education system. (5) THBT Meritocracy works well in Singapore.

Table 6

Humanities Inquiry Cycle and Debate Lessons (CPDD, 2023, p. 124–133)

Stage of Inquiry Cycle	*Descriptor of Stage (MOE, 2023, p. 126)*	*Debate Lesson*
(1) Sparking curiosity	Develop questions about societal issues, question pre-existing beliefs and assumptions.	(A) Teacher designs a debate motion aligned to the syllabus that is balanced and intriguing.
(2) Gathering data	Identify multiple sources, locate useful and relevant information.	Teacher teaches the relevant chapter and concepts. (B) Teacher assigns students to debate teams. (B) Students do in-depth research on the motion with help from Generative AI on the debate motion.
(3) Exercise reasoning	Evaluate usefulness and reliability of sources, consider multiple perspectives, reach informed conclusions supported by evidence.	(C) Students do in-depth research on the motion with help from Generative AI. (C) Students prepare arguments and rebuttals based on their team (Proposition / Opposition). (D) Student *speakers* debate each other and respond critically to differing arguments. (D) Student *observers* track each speaker's argument and write their own views of the topic.
(4) Reflective thinking	Reflect on both the process and the knowledge gained.	(E) Student *observers* conclude which team had the stronger arguments. (E) Student *speakers* reflect on their own performance. (E) Teacher gives oral adjudication (feedback) on the debate.

Table 7

Survey Results for "Normal" versus "Debate" Lesson (Open-Ended)

Preference (Score Range)	*Reason (sic)*
'Normal' Lesson (1-2)	(*Observer*) I personally feel that a normal lesson would allow for much more significant focus than a debate lesson on academics. (*Speaker*) Debate lesson is ok. So far it is like argumentative case but fun in a way but takes up some of our time I guess. Normal lessons are also fun and ok, because the lessons are interesting and examples are clear and entertaining. But in my opinion, I prefer debate ONLY if I am sitting at a corner or I am like keeping track of time. This is because I feel like if you are unfair and if a teacher kind of allows it, it might create conflicts between students. (Whole night I have been thinking abt this). (*Speaker*) I enjoy normal lessons, and it is less stressful to the debaters (when sharing) and audience (when judging).
Neutral/Mixed (3)	(*Observer*) I prefer both because if lessons you can know a bit more in-depth then if debate you would be able to know briefly but in a fun and interactive way (*Speaker*) A debate lesson was fun but was very nerve-wracking talking in front of the class
'Debate' Lesson (4-5)	(*Observer*) Debate lessons are more fun, which increases attentiveness, allowing us to absorb information much much more easily. (*Observer*) debate lessons are more effective in self revision and applying ss in real life (*Observer*) Debate lesson because it's fun and I can enjoy watching the debaters argue (*Speaker*) I preferred a debate lesson because of the interaction. I was able to learn more things from others and I was able to ask for help from my teammates.

Table 8

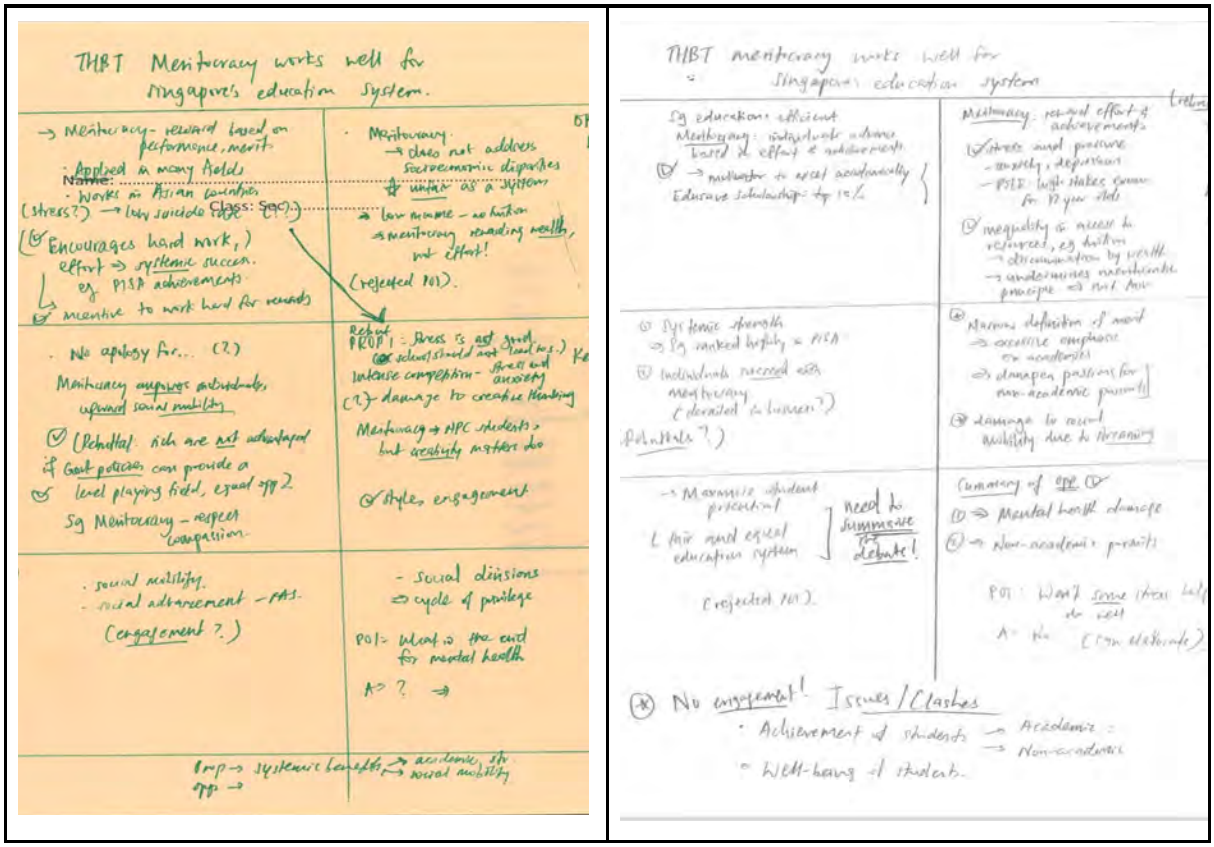
Survey Results on Learning Points and/or Takeaways (Open-Ended)

Type of Takeaway	*Learning Points and/or Takeaways (sic)*
Process outcomes (how debates work)	(*Speaker*) Always oppose your enemies when their point is unstable. Expand and ask unexpected possibilities. (*Speaker*) debate lessons allow me to learn things in a more interesting and fun way because during the debate, proposition and opposition can disagree and throw questions at each other. (*Speaker*) trying to think on the spot. when [*redacted student name*] oppose the speech on the speaker they were unable to answer on the spot so i thinking improving my creativity would be great and beneficial. (*Observer*) one takeaway is that you should always prepare the most so that we have enough content to say for 4 minutes (*Observer*) A debate is all about going back and forth, debaters expressing their conflicting views. (*Observer*) speak loud
Knowledge outcomes (syllabus content)	(*Speaker*) I learned what an autocratic government was an its examples (*Speaker*) i learned more about whether it is better to have an autocratic government in times of crisis and government's main role is to make sure no one goes hungry (*Speaker*) the governments duty is to make sure citizens are fed :) (*Speaker*) The government main role is not to only provide food for the people but to care for the citizens needs,including hunger like preserving safety and security and ensuring the wellbeing of citizens. (*Observer*) That autocratic government means having only one person in power (*Observer*) I learnt that autocracies are much easier to control and maange and enact decisions faster while democracies are more patient, slower, with more brainwork to ensure their decision is the best decision. (*Observer*) Giving food to the people is not the sole purpose of the government

Skills outcomes (collaborating, thinking, and speaking)	(*Speaker*) we needed teamwork to work properly. Without communication, our team would not have been able to complete the script in time for presentation. (*Speaker*) being confident (*Speaker*) There are many perspectives on a certain matter, there is no right or wrong (*Speaker*) Everyone can have different opinions and reasons for how they think towards the same situation. (*Observer*) one learning point is the fact that a simple question can have multiple answers with many ways to explain (*Observer*) Prepare well and think from different perspectives. (*Observer*) discussing with my classmates about a social topic can deepen my understanding towards our society

Figure 8

Samples of Written Notes Tracking the Debate by the Teacher



Appendix B: Generative AI Prompt Worksheet (Google Doc)

PLEASE MAKE A COPY & SHARE WITH YOUR TEAM AND MR SEOW (seow_yongzhi@moe.edu.sg).

AI Tools

- **Link to ChatGPT**: https://chat.openai.com/
- **Link to Microsoft CoPilot**: https://copilot.microsoft.com/

ChatGPT/CoPilot PROMPT:
For the debate motion: THBT …
Please create three distinct arguments for side PROPOSITION/OPPOSITION in simple language.
Please provide clear, direct examples for each argument.

CLASS: _____ ; **TEAM MEMBERS**: _____

MOTION: THBT _____ (PROPOSITION / OPPOSITION)	
PROP/OPP 1: _____	**Definitions** - In this debate, we define "trade-off" / "meritocracy" to mean … **Case Division** - First speaker will argue : _____ - Second speaker will argue : _____ - Third speaker will conclude **Main Argument 1:** - Elaboration - Examples - Explanation
PROP/OPP 2: _____	**Rebuttals** - Other team said …. - HOWEVER, they are wrong, because … **Main Argument 2:** - Elaboration - Examples - Explanation
PROP/OPP 3: _____	**Summary of your team's arguments** - Speaker 1 said This. - Speaker 2 said That **Summary of opponent's arguments** - Their Speaker 1 said This. But it's wrong, because… - Their Speaker 2 said That. It's also wrong, because… **Therefore we win the debate.**

Appendix C: Student Survey on Debate Lessons

The student survey was done using Google Forms. Question types are based on the options provided by Google Forms. The survey was conducted after the second cycle of debate lessons, in the first schooling term. The survey did not collect names, to reduce social desirability bias in student responses.

Student Survey Design

Question	*Question type*	*Options for response*
Class	Multiple Choice	• Class A • Class B
Were you on the debate team?	Multiple Choice	• Yes, I debated (or prepared) on a team. • No, I was a supporter / audience member.
Did you enjoy the debate lesson?	Linear Scale	1: Did not enjoy the lesson at all 5: Enjoyed the lesson tremendously
If you were a DEBATER, what helped you learn from the debate experience?	Checkboxes	• Doing research on the debate topic. • Discussing with my team mates. • Preparing my debate speech. • Watching other debaters' speeches. • Seeing multiple perspectives on one topic. • Other (fill in)
Do you prefer the 'normal' lesson or 'debate' lesson?	Linear Scale	1: Normal lesson is much better 5: Debate lesson is much better
What makes you prefer a normal lesson OR a debate lesson? Explain your view briefly.	Open-Ended (Paragraph)	
What is one learning point or takeaway from the debate lessons? Describe briefly.	Open-Ended (Paragraph)	

Did you talk about your debate after the lesson with your parents or friends?	Linear Scale	1: I did not talk about the class debate at all 5: I shared a lot about the class debate with family and/or friends
How motivated are you to find out more about SS Chapter 2: Functions and Role of Government after the debate lesson?	Linear Scale	1: Not motivated 5: Very motivated
OPTIONAL: Share any feedback (questions, concerns, and/or suggestions) for SS lessons.	Open-Ended (Paragraph)	

The dataset can be made available upon request.