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Keywords

Autonomy support, intrinsic motivation, self-determination theory, motivation, Singapore students

Cover Page Footnote

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Abstract

This paper aimed to elucidate teachers' perceptions of using autonomy support in Singapore's classrooms. Science and mathematics teachers (N = 10) were gathered for semi-structured interviews after a 10-week autonomy support intervention. Interview transcripts were analyzed using thematic analysis with emerging themes pre-conceived from the literature. The qualitative data provides meaningful insights into the teachers' understanding of what autonomy support entails, to which relevant examples of what teachers said and did to be autonomy-supportive were illuminated. The findings present an in-depth description of teachers' experiences of autonomy support, suggesting the interconnected nature of the autonomy-supportive features. Teachers should practice the features of autonomy support in a meaningful and simultaneous manner to support the students effectively. Despite the limitations, the concrete examples of autonomy-supportive practices delineated in this paper can be used as a springboard for teacher education programs and autonomy-support training workshops.

Keywords: Autonomy support, intrinsic motivation, self-determination theory, motivation, Singapore students

Introduction

The strategic goals of school systems are to promote students' genuine eagerness for learning and a sense of volition in the educational enterprise (Deci et al., 1991). Genuine interest and volition enable students to demonstrate flexibility in learning and a robust sense of personal worth and social responsibility. Henceforth, more recently, the design of conducive learning environments for fostering student motivation has received considerable attention from educators, researchers, and education administrators alike. As learning environments are

influenced by teachers, teacher autonomy support has been studied and reported as a critical facilitator of student motivation in the classroom (Reeve, 2016; Reeve & Jang, 2006).

Although the effectiveness of autonomy support in promoting student motivation has been documented (Behzadnia & Ahmadi, 2019; Cheon et al., 2020), inode needs to be reconsidered teachers' perceptions or experiences about the features of autonomy support. The ‘features of autonomy support’ refer to the instructional behaviors of autonomy-supportive teaching. Considering this gap in the literature, the present paper explores the research question, 'What features of autonomy support do teachers observe that influence student motivation in the classroom?'. The answer to this question provides an in-depth description of teachers' perceptions of autonomy-supportive practices in the classroom. As current literature has only provided general guidelines on ways to be autonomy-supportive, the findings from this study provide concrete examples of what teachers say and do to practice these autonomy-supportive features. These descriptions could equip teachers, who may need more support to adjust deeply rooted practices or need more clarification of the current research, with models to implement autonomy support and create motivating classroom contexts. Moreover, Cleary (2009) has found that 41% of teachers expressed the need for more training to translate the self-determination theory into practice. The findings can then be used as a springboard in teacher education programs or autonomy support training workshops on applying Self-determination Theory in the classroom.

Theoretical Lens

Within the tenets of Self-determination Theory (SDT), learners possess an inherent propensity to learn, to strive for mastery, and to connect with others deeply. These innate tendencies, however, need to be sustained with supportive social environments that support the learners' basic psychological needs for autonomy, competence, and relatedness, whose satisfactions then lead to more self-determined motivation (Ryan & Deci, 2000). Autonomy refers to the need to self-endorse one's actions. It relates to feeling volitional and integrated into oneself (Ryan, 1993). When a learner experiences autonomy, the learner engages in behaviors congruent to one's values and interests. Competence refers to feeling adequate in one's essential life contexts. When a learner experiences competence, the learner feels efficacious to meet the challenges in the environment. Relatedness refers to being socially and emotionally connected to others (Ryan & Deci, 2017). When a learner experiences relatedness, the learner feels cared for

by others and has a sense of belongingness and social integration. The learning environment must satisfy these fundamental needs to support self-determined motivation in students. In the present paper, SDT informs teaching practitioners of suggestions on how to build a learning environment that nurtures students' psychological needs to support student motivation to learn.

Studies based on SDT have shown a distinct focus on teacher autonomy support over recent years. Consistent with the theory, existing empirical research has demonstrated the role of teacher autonomy support in student motivation in various educational contexts (Fin et al., 2019; Zhou et al., 2019). For instance, Fin et al. (2019) demonstrated in their intervention study based on an 8-month autonomy support program that students in the autonomy-supportive group showed higher indices in basic psychological needs, self-determined index, intrinsic motivation, and satisfaction from attending physical education classes, as compared to students in the control group (no intervention). Moreover, Zhou and colleagues (2019) conducted a study in 614 Chinese primary school students to investigate the effects of autonomy support from three social agents, which included parents, teachers, and peers, on students' psychological need satisfaction, motivation, and engagement. The findings here revealed that students' psychological need satisfaction mediated the positive effects of students' perceived autonomy support from teachers on student motivation.

Studies from Singapore (Ng et al., 2016; Wang et al., 2016) have also found similar findings. For example, one study examined the differences in motivation and self-regulated strategies between autonomy-supportive and control group students in the context of science, mathematics, and design and technology (D&T) classrooms. It was revealed that students under autonomy-supportive teachers were more autonomously motivated compared to students from the control group (Wang et al., 2016). Similarly, another study showed that perceived autonomy support from teachers is strongly related to students' satisfaction with psychological needs, task value, and self-efficacy (Ng et al., 2016). The studies above have established the critical role of autonomy support in student motivation. It is, however, imperative to elucidate teachers' perceptions of autonomy support, as they are contiguous to what teachers do (or perceive to do) to be autonomy supportive and, therefore, provide valuable insights for classroom interventions (Hornstra et al., 2021). An initial examination of teachers' perspectives on autonomy support has been done in Singapore (Ng et al., 2015). The findings from the study's qualitative analysis

presented meaningful teacher insights after going through autonomy support intervention over a 5-week duration. These include the perceived value of autonomy support (e.g., student-centric learning and supportive teaching), teachers' belief in intrinsic motivation (e.g., context of learning subject affects student intrinsic motivation), teachers' expectations from their students (e.g., students need to understand critical concepts effectively), teacher self-awareness (e.g., teachers become more conscious of what they say and do in class), and teacher challenges (e.g., difficulty in exercising patience and empathy) (Ng et al., 2015). While previous work has unraveled comprehensive elucidations of teachers' views of autonomy support, more needs to be done to understand what teachers do to exemplify the features of autonomy support in the classroom. This paper sets out to identify what teachers do to embody autonomy-supportive teaching.

Teacher Autonomy Support

Teacher autonomy support is an instructional effort to foster students' self-determined motivation. Here, teachers approach the students with a flexible tone, accompanied by support and understanding (Reeve, 2016). The development of teacher autonomy support over the years defines the concept.

Several researchers identified behaviors that are associated with autonomy support (Deci et al., 1994; Grolnick & Ryan, 1987; Reeve et al., 2004; Reeve & Halusic, 2009; Reeve & Jang, 2006; Skinner & Belmont, 1993). For example, Deci and colleagues (1994) showed that providing explanatory rationales, acknowledging negative feelings, and using non-pressuring language support people's autonomy as they engage in uninteresting tasks. Grolnick and Ryan (1987) also identified behaviors such as offering choice, encouraging self-initiation, minimizing control, and acknowledging the feelings and perspectives of others as ways to support learner autonomy. Moreover, Skinner and Belmont (1993) expanded on this list by explaining the relevance of a learning activity. Reeve and Halusic (2009) also identified taking the students' perspective, acknowledging students' thoughts, feelings, and personal goals, using non-controlling language, and providing explanatory rationale behind learning tasks as ways to be autonomy supportive.

Furthermore, Reeve and Jang (2006) showed that taking time to listen, asking what students want, allowing time for students to work on their own, allowing time for students to

talk, offering praises as informational feedback, providing an explanatory rationale, offering encouragement, offering hints when students are stuck, being responsive to questions from students, using perspective-taking statements, and creating seating arrangement that promotes conversation and initiative, positively correlated with students' sense of autonomy. Meanwhile, controlling behaviors such as time holding learning materials, exhibiting solutions, uttering solutions, uttering directives, making should or ought to statements, and using controlling questions negatively correlated with students' sense of autonomy.

Collectively, research has found the following six features as autonomy supportive –take students' perspectives; vitalize students' inner motivational resources; provide explanatory rationales; use non-pressuring and invitational language, acknowledge, and accept students' expressions of negative affect, as well as display patience (Reeve, 2016).

Methods

Participants

This study used ten science and math teachers of mixed genders (one male, nine females) from ten secondary schools in Singapore. The participants' teaching experience varied from 1.5 to 31 years, ranging from lower secondary to upper secondary school levels. As this study occurred during the Coronavirus Disease of 2019 (COVID-19) pandemic, all interviews were conducted over an online teleconference program, *Zoom*, to reduce health risks for the study participants and researchers. Prior to the commencement of data collection, ethical clearance from the university's institutional review board and approval from the Ministry of Education were obtained. Furthermore, sufficient social and behavioral research training for the researcher was assured. All study participants were given an informed consent form and were briefed thoroughly on the study's objectives. The confidentiality of their interview responses was also assured.

Data Collection and Analysis

Autonomy support intervention

The present study employed a school-based autonomy support intervention to foster students' self-determined motivation over ten weeks. Before the commencement of the intervention, the study participants attended a series of intervention training workshops on autonomy-supportive teaching. Due to Covid-19 restrictions, the supposed three on-site training

workshops were reduced to two online workshops. The first workshop involved the primary training of the autonomy support intervention, which consisted of presenting the conceptual overview of SDT. An introduction to autonomy-supportive teaching and videos of each autonomy-supportive instructional behavior were also provided to illustrate them. Furthermore, previous findings on the student outcomes of teacher autonomy support were presented. Finally, a second workshop was held to conduct a check-in and gather clarifications about the intervention from the study participants.

Semi-structured interviews

Semi-structured interviews were explicitly used in this study. Moreover, probes or follow-up questions were articulated based on the ongoing responses from the study participants to generate open conversations about the topic of interest (Roulston & Choi, 2018). The interviews were conducted via Zoom individually based on the participants' preferred time and date. A broad range of autonomy support-related experiences were intended to be covered in the interview, accompanied by follow-up questions to elicit more elaborate responses on each participant's unique experience of using autonomy support. Each participant was interviewed once. Interview sessions had an average duration of thirty minutes and were audio-recorded to generate a verbatim account of the sessions for transcription and data analysis. The completed transcripts were sent to the study participants to obtain feedback.

Generation of initial codes and development of themes

The analysis employed six steps as per guidance, which include: (1) familiarising of the data through transcription, reading, and re-reading of the transcripts, (2) generation of initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) production of the report (Braun & Clarke, 2006). After reading and re-reading transcripts, initial coding was done on relevant information answering the research question. Similar codes were combined to form themes pre-conceived from the literature.

Transcripts were coded based on the features of autonomy support. For understanding students' perspectives, initial codes of 'incorporates students' input,' 'in synch with students,' and 'awareness of students' needs, wants, and emotions' were used. For vitalizing inner motivational resources, initial codes of 'piques curiosity and interest,' 'supports autonomy, competence, relatedness,' and 'frames learning activity with intrinsic goals' were used. For displaying

patience, initial codes of 'allowing students to work at their pace' and 'waiting for students' signs of initiative' were used. For using non-pressuring, informational language, initial codes of 'flexible and open-minded communication,' 'provides options', and 'saying may or might' were used. Initial codes of 'listen carefully with understanding,' 'acknowledging negative emotion,' and 'accepting the validity of complaint' were used for acknowledging and accepting negative affect. Initial codes of 'explaining the why' and 'identifying value or importance of requests' were used to provide an explanatory rationale. Responses that did not correspond to the established features were coded *in vivo* to present emergent ideas.

The interview excerpts that exemplify the essence of the point or insight being demonstrated, with the least unnecessary complexity possible, were selected for writing the report (Braun & Clarke, 2006).

Trustworthiness of the Study

Lincoln and Guba (1985) established four elements of trustworthiness in qualitative research. Credibility, the extent to which findings are congruent with reality, was ensured by iterative questioning during semi-structured interviews and regular debriefing sessions between researcher and supervisor (Shenton, 2004). Discussions with the supervisor during the analysis were a way to look for alternative perceptions, and any disagreements were discussed until a consensus was made. Dependability, which involves the study's consistency, was ensured by aligning the process of thematic analysis based on the framework described by Braun and Clarke (2006). Transferability, the extent to which results are helpful in other contexts, was ensured by conveying the study's boundaries. This was done by indicating the details of the study's context (e.g., number of schools involved and where they are based, number of participants involved, details of participants, data collection methods used, number and length of data collection sessions) (Shenton, 2004). Furthermore, lastly, confirmability, which is the extent to which participants form the findings, was ensured by being mindful that the data interpretation was not based on the researchers' perspectives and by using verbatim quotes from the participants themselves (Heery et al., 2019 Korstjen & Moser, 2018).

Findings

This section highlights the themes that describe the features of autonomy support used by the teachers in Singapore’s classrooms.

Understanding Students' Perspectives

Seven teachers shared their practice of student perspective-taking in the classrooms, albeit focusing on different angles. During rapport-building, many teachers focused on getting their students' perspectives in creating the lesson plan after understanding their needs and interests

> It is essential to build rapport and spend some time getting to know them (students) consistently. Furthermore, they prepare lessons in a way that they find meaningful. Be it through the subject matter or by discussion with friends, they will find it more meaningful. (Teacher 7)

While spoken communication was the most frequently used to obtain student perspectives, one teacher used formative assessments through surveys to gauge the perspective of the entire classroom. The teacher also found this a more feasible alternative in classrooms with bigger sizes.

> When we do a survey, we give them feedback. Having a class of 18 (students)...we can address more feedback. It is more achievable than having forty questions and forty answers... Even a simple question like how they felt today is more challenging in a class of forty. (Teacher 8)

It was also mentioned that teachers approached student perspective-taking based on the difficulty they aim to address, including adjusting their teaching focus depending on the students' real-time progress.

> For example, when I go through a particular concept, they ask, 'Teacher, why is that so?'. When it is the first time, I will repeat. If they still need help understanding, I will change how I explain it. It could be from a different point or angle. (Teacher 4)

Lastly, student perspective-taking was also linked to other features of autonomy support. One of which is the acknowledgment of negative affect. Here, the teachers tried to adjust the student's learning activity based on the student's perspective of the task. One teacher viewed this as a better approach when the teacher faced an internal hurdle to practicing acknowledgment of students' negative affect.

> I would ask them to take a break. It is okay if it is too complicated. I will give a more straightforward question to help them. Instead of three questions, I would ask them to

> focus on one... I do have one student like this. He is weak. Sometimes he will say, 'Teacher, this is too difficult'. I will say, 'Okay, never mind. Just do the first one. So that is how I do things instead of consoling him for five minutes. That is unnecessary attention. We must balance acknowledging this (negative effect) while not bringing so much attention that it becomes unnatural. (Teacher 1)

Vitalizing Students' Inner Motivational Resources

All teachers practiced the vitalization of students' motivational resources. Similar to student perspective-taking, teachers selectively chose motivational resources to focus on. Students were given autonomy on how they wanted to achieve their learning goals. For instance, a teacher mentioned giving students flexibility regarding work submissions, allowing them to decide when to submit their homework.

> I let them decide when to hand in their homework. I give them a fair deadline. For example, I want it by next week. Which day? It is still by next week. I give them an illusion of choice but limited choice... it is like showing them flexibility.... if they do not (do) their homework by their deadline, they will feel guilty. (Teacher 6)

Notably, the teachers frequently shared how they attempted to promote independent learning by allowing students to accomplish learning tasks. In this way, students were given the choice to process their learning, which vitalizes their autonomy.

> They have the choice to access any help they want to get. That is a way of getting them to be more independent in their learning. The way we acquire knowledge these days is vastly different. We do not acquire it from a textbook…we must expose students to diverse ways of retrieving information…they can access hints provided to them. They can do a Google search. They can ask their friends. There are many ways. That promotes independent learning, which I want to see in them. (Teacher 1)
>
> I will ask them, 'Do you prefer to do this activity first or the other?'. Initially, they were not used to (hearing) me asking such questions. I must decide for them. Then, they got used to it towards the end, making their responses more accurate. (Teacher 8)

Teachers also voiced how they went out of their way to facilitate self-directed learning by making a revision checklist (checklist of topics for exam revision) for their students. In this way, students can monitor the topics they need to work on and progress at their own pace.

> I give it (revision checklist) during the lesson. I walk around and speak to some of them….at least they look through everything once, and then (they) know what is required of them. I saw that during their revision, they had this sheet out. I told them to tick the last box (of topics) the day before the exam... Are they able to do all of these? It is all yes. If they have been doing consistent revision, at least they can look back, 'Okay if I still cannot do this topic, then I must focus on this more,' so it is more self-directed. (Teacher 6)

The teachers also varied their approaches, from presenting opportunities for optimal challenges to providing manageable quizzes, allowing students to experience success that gradually built their confidence, thereby boosting their competence.

> Some of them want to challenge themselves. They do not access the hints. They said they did not want to look at the hints. Then I thought, 'Okay, so it is up to them'. Even though I tried to tell them, 'Okay, you are stuck; you can look at the hints.' (Teacher 1)
>
> The quizzes and tests have the foundation (of class topics). At the same time, they pay attention in class. They have done their preparation. They should be able to pass. If they can slowly gain some achievement, they will feel better and more willing to do math. (Teacher 4)

Furthermore, the teachers elaborated on how they vitalized relatedness with their students. This includes attempting to bond with their students and building trust in their relationship.

> Lessons where they (students) are more vocal and willing to interact (with me) ... that is where I draw most of my bonding time with them and evaluate if the class is bonding with me. (Teacher 3)
>
> Some people do not do what they need to do because they feel they need to be understood initially. They are doing weird things to get people's understanding or attention or to seek help. You would not would only know if you knew the person. The relationship or the willingness of the person to be open with me depends on having trust. (Teacher 5)

At the same time, collaboration and learning among the students themselves were also encouraged. Teachers perceived this approach not just as an opportunity for the students to learn interpersonal skills but also as one of the best approaches to induce positive feelings during learning tasks. One teacher also viewed this to save more time.

> They have a group of friends to whom they can ask (questions)... some groups can (do) peer work. They can address any issues among themselves. I encourage more of that to save my time. (Teacher 2)
>
> During online learning, I put them in breakout groups. They like it. In breakout rooms, they can discuss. They like it. (Teacher 10)

Finally, teachers attempted to support students' curiosity, interest, and intrinsic goals by relating the learning activity personally to them. This was done by incorporating personal student attributes and real-life situations into conceptualizing and testing the learning material.

> There was one act where you had to make it (the lesson) more relatable to them. So, for percentage, I got them to think of ideas. For example, if you have a business, how much would you charge for your items.... Then, for rate and ratio, I asked them to find the ratio of the people born in this month and that month...find the ratio of people wearing spectacles and not wearing spectacles.... this kind of relatable thing. (Teacher 7)

Displaying Patience

Three teachers shared their accounts of displaying patience with their students. The teachers understood the strategy as indispensable when scaffolding the learning process to the students and facilitating classroom activities.

> I find myself having more time when I give more 'free play' and autonomy in doing their practice (topic exercise questions) ... if I must do both examples and practice questions, which will take half an hour... Instead, I thought, 'Okay, they already learned the basic concepts. Let me give them the free play to do the practice questions immediately. There is more time for them to do the practice questions. I have more time to facilitate (the students' learning) instead of direct teaching. (Teacher 1)
>
> I wrote down a note, and everyone had a chance to answer a question. They can answer two to three times during the lesson. Sometimes, when you ask a student a question, you tell them, 'Okay, even if you are not sure of the answer, can you try looking at your

> notes? I will give you some time to look at your notes for answers or to check your (exercise book)' because we have an exercise book where the student consolidates all my notes in class. I give them time to look through it. (Teacher 9)

Using Informational, Non-Pressurizing Language

Four teachers spoke of using informational, non-pressurizing language, albeit in more personalized ways. Some include rephrasing their statements into a question instead of framing them into imperative statements while still using pressurizing terminologies.

> I ask questions like, 'Should you do this?'. So instead of saying, 'You should do this,' I ask them, 'Should you do this?' then some of them will nod, and I will say, 'Yeah, you should do this.' I am just taking it word for word. (Teacher 6)
>
> There were times when we just wanted to say, 'You, keep your Chromebook! We are learning now!'. However, now I must call the person nicely, 'What are you doing? Do you know what we are doing? Are you aware? Where is your worksheet?'. (Teacher 2)

Acknowledging And Accepting Negative Affect

Five teachers acknowledged and accepted the negative effects of students in their classrooms. Most teachers used a more direct and verbal approach to show acceptance of negative emotionality by speaking to the students in an understanding tone. The following excerpts elaborate on how this was conducted.

> Whenever a student feels off during the lesson, instead of assuming that the student is being mischievous, I will ask the student to go outside the classroom. In there, we will have a good talk. I will know the exact issue of the struggling student. (Teacher 4)
>
> I spoke to students. They mentioned having a fear of mathematics. This could be due to past experiences... not-so-nice experiences with their primary school teachers. I sensed the approach: 'If I say this, then you must do this.' The students felt that (the teacher) was unreasonable. They were fearful of the teacher. They had no interest in the subject, and they were struggling. Building a good rapport and that there is a root cause for students' feelings of not liking mathematics. (Teacher 4)

Compellingly, one teacher also recognized that there are indirect ways of acknowledging negative affect, more appropriate in less intensified situations. The teacher expressed that not

pointing out or not speaking of the perceived negative emotions de-emphasizes the situation and thereby indirectly acknowledges its normality as part of the learning process.

> I naturally go into problem-solving mode. Even though at the start of the class, I thought, 'Okay, I want to accept negative affect. It naturally goes into that (problem-solving). It is not that the student displayed negative affect, so I must console the student. It is like, 'Teacher, how do I do this?'. Is that considered a negative effect? Is that the kind of struggle that we want to highlight? Not highlighting it downplays the thing; students will feel it is normal. (Teacher 1)

Providing Explanatory Rationale

Four teachers shared that they understood providing an explanatory rationale to communicate teacher's requests to their students. The teachers explained the value of understanding a new topic before delivering the lesson's content

> I have gotten valuable feedback from my students. They can tell that I varied more in their readings. I went more deeply into why (there is a need) I needed to study the topic instead of just going straight into it. (Teacher 8)

It was also highlighted that the strategy of providing explanatory rationales may not always be well-received by the students, especially in situations where the student-teacher rapport has yet to be established. As such, one teacher claimed that this strategy was only employed later in their interactions, wherein connections had already been strengthened.

> You are trying to find out what they (students) need and want. Nevertheless, you are also trying to guide them by explaining the rationale. Sometimes, they need to be more receptive to your rationale. That is not easy. They have their mood. Sometimes, they will listen; sometimes, they will not listen. Over time, when you build a rapport with them, they understand that what you are doing is good for them and that you have their interest at heart, so they take your advice. (Teacher 6)

Providing Encouragement

While the teachers practiced the six established features of autonomy support, presenting the emergent ideas of teachers' understanding and approach to delivering autonomy support in their classrooms is worthwhile. It was communicated that encouraging their students and

acknowledging adverse effects was also frequently done in the classrooms. Teachers tried to use verbal statements that imply optimism and inspiration to their students.

> Before the exam, we had a Zoom lesson. I conducted a Zoom lesson to help them to revise. I know not all will turn up. However, in the evening, more than ten students came. I told them, 'Since you are here, it means that you are willing to put in effort and that you want to try.' (Teacher 9)

Providing A Safe Space to Ask Questions

The teachers shared that their classrooms are welcoming of students' questions. It was explicitly mentioned that they encourage the quieter students to ask questions to enhance their learning and to avoid leaving them behind and unheard.

> I tried to establish from the beginning that nothing is a stupid question unless I just said it. For example, I say, 'This is blue,' and the next question you ask me is, 'What color is this?'. That is (because) you did not pay attention. If it is other questions, it does not matter what question it is. I told them, 'It may sound silly to you, but someone might thank you for it because they also want to ask the same question.'... It is the idea that you constantly encourage them to ask (questions). We walked around the class and saw if the shy ones had questions. (Teacher 5)

Balancing Act Between Autonomy Support and Other Factors

Though the teachers endeavored to practice autonomy support as much as possible during the intervention period, they also shared how they balanced these practices with other factors to a certain extent. These factors include maintenance of classroom structure and time management.

> You must change your approach. You can be very firm today and try something more motivating tomorrow. Then, the next time, you can decide to do something else. It is a very calculated approach, depending on many factors. (Teacher 9)
>
> Time is a huge factor. Despite being slow, some students keep asking for more time to work on things and experience success within the class. Sometimes I must balance…. I must move on for the sake of completing the syllabus. Time is always a huge factor. (Teacher 1)

Discussion

Generally, the teachers in this study practiced some of the features of autonomy support more commonly than others. This was the case in vitalizing inner motivational resources and obtaining student perspectives. The findings also suggest that teachers practiced some of the features of autonomy support in more varied ways than others, particularly in vitalizing inner motivational resources and acknowledging adverse effects. In addition to the six established features of autonomy support, the teachers understood providing autonomy support in their ways. For instance, they can use encouraging words before student assessments, deliberately invite students' questions in class, and balance autonomy support with factors such as maintenance of classroom structure and time management.

Regarding student perspective-taking, the teachers mainly tried to obtain an understanding of students' wants and preferences, either through verbal communication or the use of surveys. They incorporated them into their subsequent lesson plans. Moreover, the needs of the struggling students were prioritized and accommodated accordingly without compromising the learning goal of the task. For instance, Teacher 4 shared that she adjusted her explanations of certain concepts when her students expressed difficulties in understanding such concepts. Likewise, Teacher 1 shared an account of reducing the number of questions to be answered by the student when the same student conveyed struggle in answering the set of questions. Generally, the data suggest that teachers can implement this autonomy-supportive feature at different time points across the instruction episode due to its broad applicability (e.g., lesson planning, understanding student difficulty or misbehavior, keeping students engaged during class).

Vitalizing inner motivational resources was carried out by the teachers in more varied ways. For instance, many teachers tried to give students a choice (e.g., resources to use, own deadlines, order of activities). While these choices are rather simplistic, previous research suggests that these choices can still vitalize student autonomy (How et al., 2013). A revision checklist was also provided to the students. The revision checklist referred to here is a list of topics students need to revise, at which students monitor their learning progress as they revise. It provided students the freedom and agency to own their learning progress and thereby allowed self-direction in learning. Competence support was enabled by stimulating students with

appropriate challenges and by letting them experience gradual success. Establishing student-teacher relatedness and peer relatedness were also considerably practiced by the teachers. Teachers tried to bond with their students by building a foundation of trust to understand them more meaningfully. This is supported by previous research on the importance of trust in establishing student-teacher relationships (Van Maele & Van Houtte, 2011). Teachers tried incorporating more group work in their lessons to nurture peer relatedness and encourage student collaboration. Lastly, teachers attempted to tap into students' curiosity, interest, and intrinsic goals by making the learning activities relatable to their everyday lives and by highlighting the relevance of learning activities to their potential future goals (e.g., future business ideas).

The acknowledgment of adverse effects was carried out in direct and indirect ways. Most teachers tried to speak directly to the students and validate their concerns and struggles. Teacher 1, who shared his difficulty in practicing this act, explained that not highlighting certain levels of student struggle can acknowledge its normality as part of the learning process. In this way, it can indirectly communicate the validity of students' concerns, thereby acknowledging them. This is an exciting finding as it shows ways to practice certain features of autonomy support more efficiently. This is then specifically useful to novice teachers or teachers new to autonomy support.

Displaying patience, using non-pressurizing language, and providing rationale were carried out by the teachers more straightforwardly. To display patience, teachers mainly allowed students' initiative to accomplish learning tasks without immediately providing help. It allowed the teachers to scaffold students' learning and provided a basis for acknowledging students' difficulties. Regarding using non-pressurizing language, the teachers indicated that while it is challenging to eliminate the use of pressurizing words, they still attempted to practice this autonomy-supportive feature by using a questioning tone instead. Using a questioning tone gives students less of an impression of being controlled and pressured by their teachers. Teachers also explained that while they can provide explanatory rationale for understanding a new topic or the importance of teacher requests, students are only more receptive to these explanations when establishing student-teacher rapport, highlighting the importance of building relationships (Frymier & Houser, 2000).

It is also worthwhile to highlight teachers' understandings of autonomy-supporting and how they expressed these in their classroom situations. Teachers shared that they used encouraging words and other autonomy-supportive features to support their students. They tried to be exceptionally encouraging when acknowledging students' expressions of negative emotions. Furthermore, to lessen students' fear of a subject, teachers invited students to ask questions during class deliberately. Notably, the data suggest that autonomy support in the classroom necessitates teachers to be more inviting to students' queries to enhance students' comprehension of scientific and mathematical concepts. Finally, as much as the teachers tried to support autonomy throughout the intervention, they emphasized the importance of balancing autonomy support and practical factors such as time and classroom structure. It should be noted that while teachers understand the benefits of providing autonomy support, it is challenging to practice consistently due to these pragmatic limitations.

Overall, the findings suggest that while the features of autonomy support are operationally distinct, they are optimally carried out simultaneously to support students. For instance, when teachers identify students' difficulties through perspective-taking, teachers also exercise patience and acknowledge these concerns without passing judgment. At the same time, teachers would also use encouraging words to make the students feel better about themselves, provide opportunities for future success, and vitalize their competence needs.

Practical Implications

There are two main implications derived from the study's findings. Firstly, teachers may need to be trained to practice some of the features of autonomy support on a deeper level. For instance, teachers may need further understanding of what it means to vitalize students' autonomy. Besides providing students with options on the procedural aspects of learning activities, teachers must find ways to facilitate self-directed learning to ingrain students' deep sense of agency and ownership. Secondly, it is worthwhile to highlight that autonomy support is interconnected and that teachers should practice two or more autonomy-supportive features simultaneously, whenever relevant, to provide meaningful support to students. For instance, displaying patience and acknowledging negative affect may be more effective in concert. When students struggle to understand a concept, teachers should acknowledge their negative

expressions and display patience in tackling students' challenges. In this way, more holistic support is provided to the students.

The present study offered novel insights into how autonomy support was carried out in the context of Singapore's educational settings. Teacher educators could use the findings in this study in training pre-service teachers to be autonomy-supportive in the classroom. The study's in-depth and vivid excerpts demonstrate more apparent ways to practice autonomy support, which could assist novice teachers in transitioning to autonomy supportive.

Limitations and Future Research

Though the current study is small-scale qualitative research with ten teacher participants, the present findings shed light on what teachers say and do to practice autonomy support in the classroom. There are still vital limitations to consider. Firstly, the data in this study are self-reported as they are derived from teachers' perceptions. The participants' recollection of their autonomy-supportive experiences may be limited by memory, as they verbally indicated during the interview. However, the participants were given ample time to remember their experiences before they responded during the interview. Follow-up questions were prompted from their initial responses to allow them to elaborate on their points. Observing teachers' actual practices of autonomy support in the classroom strengthened the credibility of the findings, as it will better reflect the reality of teachers' autonomy-supportive practices in the classroom. However, this was not possible as the study was conducted amid the Covid-19 pandemic. Future research could do data triangulation by recording actual classroom interactions, using field notes and classroom observations, and exploring students' perceptions of autonomy support to their motivation across all curriculum and grade levels.

Conclusion

The present study explored the teachers' perceptions of using autonomy support in Singapore's educational settings. The findings highlighted that teachers could practice the features of autonomy support in their classrooms. Some were carried out more commonly and in more varied ways than others. However, further work is needed to confirm the findings of the study. It is recommended that subsequent investigations build on the current findings to elucidate the myriad of ways teachers apply autonomy support in the academic context.

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