


Factors Promoting Student Agency and Community Engagement: Case of a Lebanese Public High School


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Abstract: OECD (2019) defined student agency as the ability to set goals, reflect, and act responsibly to endorse change. It is the quality of students' engagement and interaction with peers, teachers, parents and the wider community. The purpose of this research is to investigate and track the factors of promoting student agency and community engagement leading the change. Thirty nine students at a public high school in Lebanon were trained on STEAM activities such as: coding, robotics, electronics, crafts and 3D printing. Students took the initiative with continuous encouragement and facilitation from the principal and teachers to enrol and lead a community- based STEAM laboratory. A self-reflection questionnaire for students was administered in order to measure the characteristics and processes of the student agency. This case study used interviews, and focus groups in order to track the factors promoting this agency. The results of this study will inspire policy makers and school principals to promote student agencies and community involvement.

Keywords: Student agency, Community, STEAM laboratory, Public high school

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Introduction

Student agency has gained more attention among education researchers, policymakers, and practitioners in recent years (Lehtonen, 2015). It refers to the capacity of students to take ownership of their own learning, make decisions, and act upon them in ways that support their personal growth and academic achievement. In the 21st century, the skills of self-regulation, self-efficacy, and self-determination have become essential for students to succeed and thrive in various learning environments (Reeve & Tseng, 2011). Moreover, research has shown that

fostering student agency can lead to positive educational outcomes, such as increased motivation, engagement, persistence, and academic performance (Völkl et al., 2023). In addition, promoting student agency can also contribute to the development of students' social-emotional competencies, such as resilience, social awareness, and empathy (Blair et al., 2018).

Theoretical Framework

There is no consensus on a specific definition of student agency. In the context of the OECD Learning Compass 2030, student agency denotes a sense of responsibility as students engage in society and aim to affect people, events, and circumstances for the better (OECD, 2019). The OECD Learning Framework 2030 offers a vision and some underpinning principles for the future of education systems. According to OECD, student agency is the ability to frame a guiding purpose and identify actions to achieve a goal rather than “student autonomy”, “student voice” and “student choice”. Agency is at the heart of the OECD Learning Compass 2030 and is defined as the competency to think, initiate and act intentionally and responsibly to shape the world towards individual and collective well-being, it necessitates the capacity to articulate a driving goal and specify actions to realize a vision (OECD, 2018). However, the development and prerequisites for agency have received little explicit attention in education (Jääskelä et al., 2020). When students are agents in their learning, that is, when they play an active role in deciding what and how they will learn, they tend to show greater motivation to learn and are more likely to define objectives for their learning (OECD, 2019).

Two factors, in particular, assist students in gaining agency. The first is an individualized learning environment that encourages and supports each student to pursue their interests, connect various learning opportunities and experiences, and design their own learning projects and processes in collaboration with others. The second is building a solid foundation of literacy and numeracy. In the era of digital transformation and with the advent of big data, digital literacy and data literacy are becoming increasingly essential, as are physical health and mental well-being (OECD, 2018).

Agency can be developed as students learn, receive feedback and reflect on their work, this is referred to as the “Anticipation-Action-Reflection (AAR) cycle” according to the OECD learning compass 2030. Anticipation, action and reflection are competencies in their own, however, when combined in a cycle, they can assist and accelerate the development of student agency (see Figure 1).

The Anticipation-Action-Reflection (AAR) cycle is an iterative learning process whereby learners continuously improve their thinking and act intentionally and responsibly, moving over time towards long-term goals that contribute to collective well-being. Through planning, experience and reflection, learners deepen their understanding and widen their perspective. As learners engage actively in iterative cycles of anticipation, action and reflection, they can gain a sense of accountability because they feel more connected to the issues and problems being examined. In this sense comes the belief that they can make a difference in society. The AAR cycle enables learners to express and develop their agency both in classroom contexts and in life more generally.



Figure 1. Anticipation-Action-Reflection (AAR) Cycle

The AAR cycle consists of three phases: In the first phase, learners use their abilities to anticipate the short and long term consequences of actions, understand their own intentions and the intentions of others, and widen their own and others' perspectives. The second phase is where learners take action towards well-being. In the third phase, learners reflect on their thinking, which leads to deeper understanding and better actions towards well-being.

This study implemented the AAR cycle as a conceptual framework for tracking student agency. Students in the STEAM lab anticipated, planned, executed, and reflected on their community-based projects. During this process students attended many workshops to enhance their digital skills, data literacy, communication, problem solving and critical thinking skills.

On the other hand, according to Salmela-Aro (2009), student agency is influenced by parents, peers, teachers and the wider community, this led to the development of the term "Co-agency", often referred to as "collaborative agency", which implies the influence of a person's environment on his or her sense of agency. The concept of co-agency recognises that students, teachers, parents and communities work together to help students progress towards their shared goals. Co-agency is important for students' agency in terms of goal construction and reconstruction.

As a result of a project done by OECD in 2018, Hart's ladder of student participation in activities and decision making was used to develop the "Sun Model of co-agency" which illustrated the level of interaction of adults in each level of student agency (OECD, 2019), as presented in Figure 2.

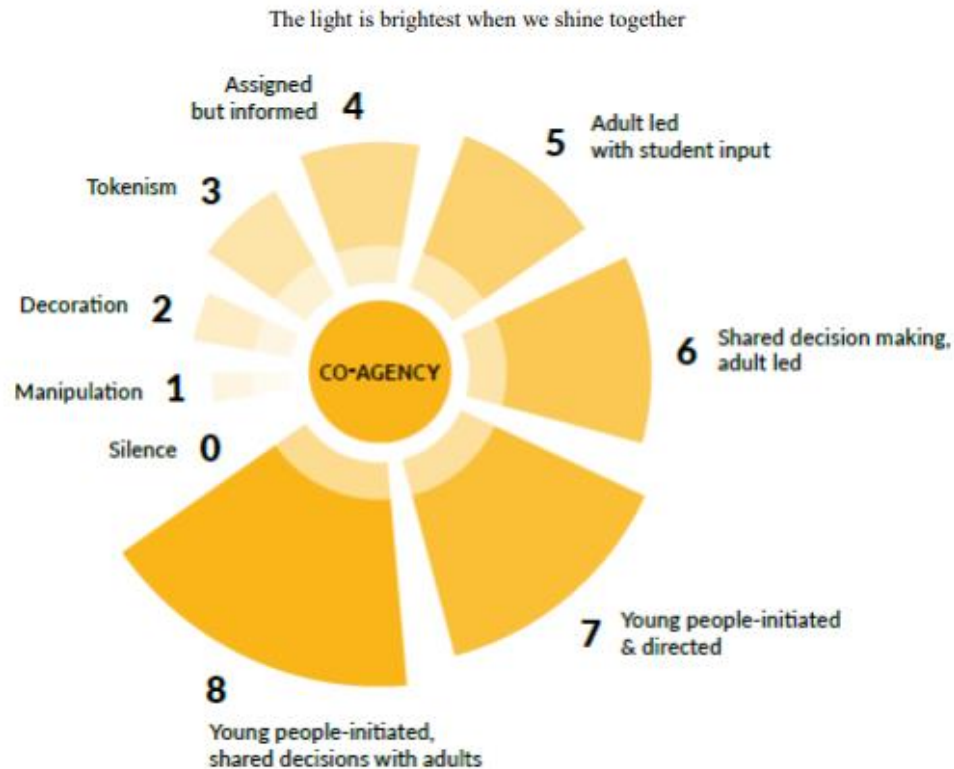


Figure 2. Sun Model of Co-agency (OECD, 2019)

To explain this model, the table below developed by OECD (OECD, 2019), describes, operationally, each level explaining the role of the student and that of the adult (see Table 1). The Sun model in this study was used to evaluate the level of interaction of adults, principal, teachers, and community members in the student agency.

Table 1. The Role of Young People/Students and Adults in each Level of Student Agency

Level of Student Agency	Level of interaction with adults
0.Silence	Young people remain silent and adults take and lead all initiatives and make decisions
1.Manipulation	Adults use young people to support causes, pretending the initiatives is from them
2.Decoration	Adults use young people to help a cause
3.Tokenism	Adults appear to give young people a choice, but there is little or no choice about the substance and way of participation
4.Assigned but informed	Young people are assigned a specific role and informed about how and why they are involved, but do not take part in leading or taking decisions for projects
5.Adult led with student input	Young people are consulted on the projects designed, and informed about outcomes, while adults them and make the

	decisions
6.Shared decision making, adult led	Young people are part of the decision making process of a project led and initiated by adults
7.Young people-initiated and directed	Young people initiate and direct a project with support of adults. Adults are consulted and may guide/advise in decision making, but all decisions are ultimately taken by young people.
8.Young people-initiated, shared decisions with adults	Young people initiate a project and the decision making is shared between young people and adults, leading and running the project is an equal partnership between young people and adults.

Literature Review

Role of the Principal

The role of a principal in promoting student agency is critical in today's educational landscape. A principal who prioritizes student agency can create an environment that fosters self-motivation and curiosity, leading to improved academic outcomes, social-emotional skills, and overall well-being. A principal can encourage student voice by allowing students to have input into their curriculum choices, and school activities. Teachers can also be encouraged to give students opportunities to think critically, collaborate, and solve problems on their own. Furthermore, research has shown that student agency promotes long-term success in both academic settings and the workforce (Henderson & Mapp, 2002). A principal who recognizes this can greatly impact the success of their students. According to a study by Zimmerman and Schunk (2011), when students have agency, they take ownership of their learning and are more motivated to succeed. A principal can promote student agency by creating opportunities for student voice, choice, and leadership (O'Neill, 2017). This can include involving students in decision-making processes, allowing them to design and lead projects, and providing choice in classroom assignments. When students feel empowered and in control of their learning, they are more likely to be engaged and invested in their education. Therefore, the role of a principal in promoting student agency cannot be overstated, as it can have a significant impact on student success both academically and personally.

Role of the Teachers

Teachers play a crucial role in promoting student agency, which is defined as "the power to take meaningful actions and solve problems" (Reeve & Shin, 2020). Teachers can support student agency by creating a learning environment that enables students to set their own goals, make decisions, and take ownership of their learning. This can be achieved by providing opportunities for student choice and autonomy in activities, encouraging risk-taking, and facilitating reflection and self-assessment. Research has found that teachers who implement a student-centered approach to instruction, where students' interests, experiences and perspectives are valued, are more likely to promote student agency (Zeiser et al., 2018). Ultimately, when teachers prioritize student agency, they foster a sense of empowerment and engagement in their students, which can enhance their motivation and achievement both in and out of the classroom.

Rationale

Promoting student agency, students can develop important skills such as self-regulation, critical thinking, and self-efficacy (Zimmerman, 2000). Research has shown that when students have agency in their learning, they are more engaged, motivated, and achieve higher academic outcomes (Gao & Liu, 2020). However, despite the potential benefits of student agency, many students still struggle to engage in self-directed learning. This highlights the need for further research to understand the factors that contribute to students' agency and how it affects their academic achievement. By having agency, students are able to set goals, monitor their progress, and regulate their motivation and emotions. Moreover, agency is linked to the development of higher-order cognitive skills such as critical thinking and problem-solving (Zimmerman, 2000). In recent years, researchers have emphasized the importance of promoting student agency in educational settings, particularly in the context of online learning. For instance, Wang et al. (2020) examined the relationship between student agency and academic performance in online courses. Their findings suggested that students who have higher levels of agency are more likely to actively participate in online discussions and achieve higher grades. However, little attention has been given to the role of agency in traditional face-to-face classroom settings, particularly in K-12 education.

Research shows that student agency increases civic engagement because students with more voice build stronger learning communities with teachers, they grow important academic characteristics and attitudes such as efficacy, engagement and motivation, and they welcome opportunities for experiential learning during their civic engagement (Hoefnegals, 2015).

Purpose of the study

The study was conducted in a Lebanese public high school implementing a community based STEAM lab. The purpose of this research is to assess the characteristics of the students agency, and to investigate and track the factors of promoting student agency and community engagement leading the change. The research addressed the following questions:

Main question: How can a student agency be developed in a school ?

- 1- What constructs characterize a student agency in the case under study ?
- 2- What are the factors leading to the development of the student agency ?

Method

Research Design and Sample

This study is a descriptive case study that assessed student agency and uncovered the factors behind that agency. The study applied a mixed method approach where quantitative and qualitative data were collected. The sample of this study included high school students, teachers, school principal, community members, and experts who

were involved in a community-based STEAM project in a Lebanese public high school. This project was funded and supported by *nafda* which is a Lebanese nongovernmental organization and principal led movement that aims to reform the education system to become more reinforcing of active citizenship, social justice, and good governance.

Data Collection Tools

Several data collection tools were implemented for triangulation purposes. Students' survey was used to measure the characteristics of the student agency. The survey's items were categorized into seven constructs: 1) self- efficacy, 2) perseverance of interest, 3) perseverance of effort, 4) locus of control, 5) mastery orientation, 6) metacognitive and self regulation, and 7) future orientation. Each construct was measured with between four and nine survey items, and responses to survey items ranged from 1 (disagree) to 4 (strongly agree) . For each survey construct, we calculated a scale score by averaging responses to relevant survey items. In addition, the survey included students' demographic information: Gender; grade level; learning language; time they joined the lab, the department joined, their effective role, and why they joined the lab.

To infer the factors that favored the development of student agency , semi-structured interviews were performed with the school principal, involved teachers, community members and experts. Moreover, a focus group with five active students in the STEAM lab was conducted to study the effect of the content and process of the STEAM-based projects, and the role of each of the principal, involved teachers, community members, and experts in promoting their agency. Students were asked to provide feedback on the following: opportunities they have been provided in the STEAM lab; their role as active members; the practices of the principal, teachers, experts, and community members; the skills they developed and the factors that favored the development of these skills; the projects accomplished; ideas for improvement.

Validity and Reliability

The survey is a validated instrument adopted from a study done by the American Institute For Research (AIR):" Maximizing Student Agency Implementing and Measuring Student-Centered Learning Practices" (Zeiser et al., 2018). The survey was piloted on five students that were not involved in the research. For reliability cronbach alpha was calculated to be 0.894 which shows high reliability and greater internal consistency of the items in the survey. The data from interviews and the focus group were transcribed, coded and analyzed by the three researchers collaboratively. The themes generated from the interviews were validated by the researchers through inter- rater reliability.

Results and Discussion

Thirty nine students from the STEAM lab completed the survey adopted from the American Research Institute (Zeiser et al., 2018). 65 % of the participants are females, and 80 % learn mathematics and science in English.

The students are distributed over four departments: Coding and web development, 3D printing, sewing, and Mechatronics (see Figure 3).

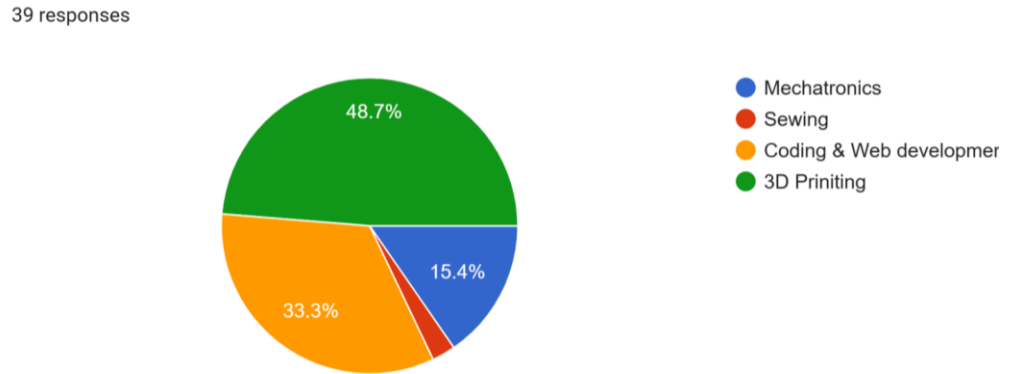


Figure 3. Distribution of Participant Students according to Departments

According to a scale from 1 to 5 (1 least effective and 5 most effective) the majority of students more than 80 % declared that they play an effective role in developing and sustaining the STEAM lab as illustrated in Figure 4.

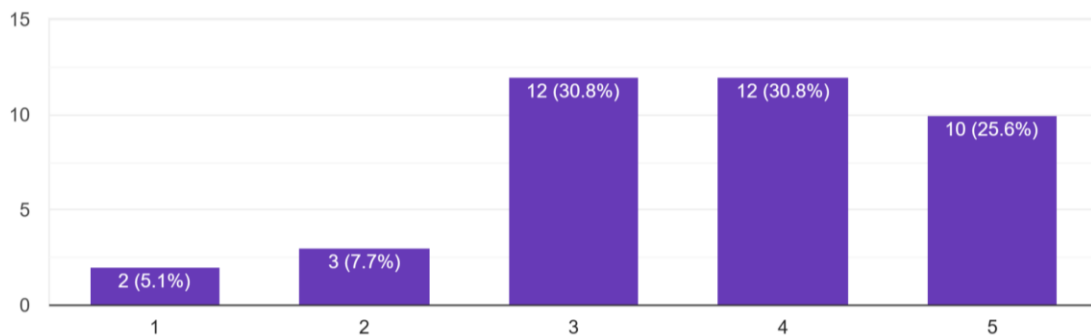


Figure 4. Effectiveness of the role of students in STEAM lab

To answer the first question of research about the characteristics of student agency, the survey constructs were measured based on specific constructs, the mean, minimum, maximum and standard deviations were calculated for each construct (see Table 2).

Table 2. Means and Standard Deviations of Students Agency Constructs

Constructs	N	Minimum	Maximum	Mean	Std. Deviation
Self-efficacy	39	1.88	4.00	3.13	.463

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Perseverance of Interest	39	.00	3.50	1.67	.988
Perseverance of effort	39	2.00	4.00	3.0	.537
Locus of control	39	1.57	4.00	3.00	.548
Mastery Orientation	39	2.25	4.00	3.41	.504
Metacognitive and Self-regulation	39	2.00	3.36	2.61	.35
Self-regulated learning	39	1.67	4.00	2.99	.62
Future Orientation	39	1.80	4.00	3.31	.54

The items in the survey were coded on a scale from 0 for strongly disagree to 4 for strongly agree and 2 for neutral. The analysis of the results indicates that the mean for all constructs is greater than 2 except for the construct “perseverance of interest” which was calculated to be 1.67. The highest mean was for the self-efficacy construct. The results demonstrate that the participant students satisfy the agentic characteristics.

To infer the factors leading to the development of student agency in the case studied, interviews were conducted with the school principal, two of the teachers that followed the students in the Steam lab, a community member, and an expert from *nafda* who evaluated students’ projects.

Principal’s Perception

According to the principal, the main factors for the student agency were: The principal belief in the students’ capacities and the trust in their potentials; the students’ commitment to use the STEAM Lab and to learn coding and other skills. Moreover, in line with practicing good governance, students developed a code of behaviour and a management structure for the lab, they created the lab curriculum, rules and policies, and they made their direct connections with the students. They were given the chance to explore the community’s needs through visits to their workplace. For instance, a website for a flower shop was designed by the students.

Teachers’ Perception

Based on the teachers’ perceptions the factors that enhanced the development of student agency were: Students’ interest in the projects they worked on, they were not afraid to do mistakes, they were motivated and enjoyed what they were doing; The STEAM lab environment which allowed students to practise teamwork, acquire communication, problem solving, and critical thinking skills; the training that the students followed; the opportunity provided to students by the school principal and the involved teachers to have voice and choice, to

learn from their own mistakes, to practise leadership, to design their own projects, and to take decisions; providing the appropriate environment for creativity (STEAM lab) in terms of technologies that simulate their aspiration; their close ages and their ability to understand each other, think collectively, and the spirit of cooperation among them; the trust, encouragement and responsibility given to them; the moral support and positive feedback from teachers; the freedom to make the appropriate decision and find solutions.

Community Member Perception

According to the community member who accompanied the students from the moment of STEAM lab creation, the main factors that allowed students to be agentic were: The fact that students were given the opportunity to be active community members; to address community needs and take the initiative to solve problems; the workshops provided for students who were ready to explore their highest potential; the future vision of the principal who provided them with full control of the lab; the skills gained by students by sharing the lab responsibility; the shared experience, help and guidance provided by the community members when necessary.

Expert's Perception

The expert interviewed stated that promoting students agency was the result of different factors: First, the governance system that was demonstrated by the principal where students voice and agency were respected and reinforced throughout the extracurricular practices including the community- based STEAM lab. Seond, the leadership style of the principal who modelled the transformative leadership style where the vision of community engagement and social justice was reinforced. Third, the training approach adopted in the STEAM lab where students interest, voice, and leadership were reinforced with clear and informative resources allowing students' autonomy. Fourth, students' personal traits who were intrinsically able to work collaboratively in STEAM lab. Fifth, community appreciation for students' initiatives. Moreover, the project management approach that reinforces student centeredness, distributed leadership and connection to values of active citizenship, social justice and good governance and community support through community visioning process, enhanced the development of student agency.

Students' Perception

A focus group was performed with four students from the STEAM lab who are committee members that participated in creating the lab, and that satisfy the agentic characteristics. According to them, the motivation and support of the principal that always listens and shed light on specific issues enabled them to acquire these characteristics. The bonding between the team members that are now able to communicate very well, and to help each other in problem solving and decision making is one of the main factors that led to development of student agency. They declared that they were able to access the STEAM lab at any time, even after school and on weekends. Moreover, they thought that the agentic characteristics were enhanced due to the self-confidence, commitment, responsibility, critical thinking and pride acquired by the members after training and practising

teamwork during their projects. The projects designed were based on solving problems in the community.

Cross analysis of the data collected from interviews led to the emergence of specific themes related to student agency: the self-directed learning created in the STEAM lab; the training provided to students which allowed them to acquire skills of communication, collaboration, problem solving, critical thinking, decision making...; students' goal setting and responsibility during the initiation, planning, and execution of the projects; the project management approach; creativity and innovation; leadership and advocacy. The emerged themes along with evidence extracted from the data collected from the interviews are summarized in Table 3.

Table 3. Themes Emerged from Interviews and Focus Group

Theme	Principal	Teachers	Students	Community
Self- directed Learning	The principal believes in the students' capacities and trust their potentials	The self-learning opportunity provided to students by the principal and teachers	Self-commitment and responsibility	Students suggest solutions to problems they face and try to prove its validity
Collaboration & Team work	The principal encourages students to work together on projects and share their ideas	Communication, problem solving and critical thinking skills of students	Students communicate very well, and help each other in problem solving and decision making	Students were active community members who work in collaboration to solve real life problems
Goal Setting & Reflection	Principal listens to students and shed light on specific issues, this enabled them to acquire these characteristics	Students set their goals and monitor their progress	Students signed a social contract	Sharing responsibility and reflecting on their progress
Choice and voice	Students developed a code of behaviour and a management structure for the lab	Students choose their own projects and modes of presentation	Students have access to the lab all the time	Students' voice and choice was respected
Creativity and innovation	Trust in students' capacities boosts their creativity	Technologies that simulate their aspiration	Being able to learn from their errors and try again	The training followed by students had

				uncovered their highest potential
Leadership and advocacy	the vision of community engagement and social justice was reinforced.	Response of students to the community needs through design thinking	Solving problems in the community	Leadership and connection to values of active citizenship, social justice and good governance

Moreover, based on the sun model developed by OECD the analysis of the data showed that the students engaged in the STEAM lab projects are at the last level of the student agency where they initiate projects based on community needs and problems faced. The decision making related to projects were shared with adults: principal, teachers, and community members. who supported and guided the students during this process.

Conclusion and Future Recommendation

This study aimed to investigate the factors that lead to the development of student agency in a public high school who implemented a student led community-based STEAM lab. The students acquired agentic characteristics through planning, experience and reflection on their own projects. Students were given the responsibility to make decisions and own their own learning. Students were able to create the lab committee, curriculum, policy and rules. They designed Makerspace projects, teaching materials to be used in explaining science concepts in class using the 3D printer, three websites, and many robotic models. Moreover, the committee students are now in the process of training other students in three different schools.

Finally, based on our study the main factors that enhanced the development of student agency in our case are: The principal leadership style; teachers' guidance and follow up when requested by student; students' interest in the projects; the training approach which leads to students' self- efficacy; community support and appreciation to students' work; the project management approach; connection to values; and the personalised environment of STEAM lab as well as . This is in congruence with the study of Crowhurst and Cornish (2020), who identified five key factors to support students to have more agency in their learning: independence and ownership, scaffolding, students as teachers, joyfulness, and reflection. Similar factors were also identified by Wenmoth et al. (2021): students' engagement in active self directed learning experience; students' leadership; time management, and collaboration skills; students' reflections and teachers' feedback.

Similar projects can be implemented in schools to enhance agentic characteristics that allow students to acquire skills such as leadership, critical thinking, communication, collaboration, decision making, and problem solving. The factors that promote student agency inferred from this study can be implemented in regular classes giving

chance for students to set their learning goals and hold the responsibility to fulfil these goals.

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