ANY QUESTIONS? IDEAS FOR ENCOURAGING MORE AND BETTER STUDENT QUESTIONS

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Abstract

One of the key characteristics of student-centered learning is the active involvement of students in the learning process, where they co-construct knowledge with the guidance of the teachers and in collaboration with their peers. The co-construction of knowledge can be greatly facilitated when students respond to teachers’ questions and when they themselves generate well-thought out questions. The purpose of this article is to discuss the role of student-generated questions in a student-centred learning environment and to offer practical strategies for language teachers to guide students in asking more and better questions in the classroom, i.e., the kind of questions that promote deeper engagement and learning.

Keywords: EFL, ELT, ESL, student-centered learning, thinking questions

Introduction

Most of us teachers and our schools, universities, and other education institutions want to be student-centered. But what is student-centered? And, how can the questions we and our students ask create a student-centered environment? Student-centered learning (Jacobs, Renandya, & Power, 2016), also known as learner-centered, has many characteristics, including a focus on student needs and interests, a diversity of methods and materials, a role for students in assessment, a greater role for teachers in facilitating learning than in dispensing knowledge, an emphasis on creative and critical thinking, a laboratory for students to learn skills to prepare themselves for lifelong learning, and an environment of cooperation.

What about the role of questions in student-centered learning? All the above characteristics of student-centered learning thrive on questions, especially the development by students and teachers of their question-asking abilities. The purpose of this article lies in presenting you, our fellow teachers, with ideas we have found helpful for encouraging our students to ask more and better questions to us, their classmates, and themselves. The article begins with some background on student-centered learning.
Student-Centered Learning

What is the main way that people learn? Is learning mostly from external sources, with teachers and others deciding what we should learn and poring the information into students’ heads via lecturing and other means? Or, is learning mostly an internal process, with people deciding what to learn and each developing their version of knowledge?

Teacher-centered learning focuses on the external, with teachers and their superiors in the education hierarchy deciding what and how students learn. Nowadays, we hear more about student-centered learning, with more focus on the internal, as students have more power over the what and how of their own learning. To use IT jargon, which – teacher-centered or student-centered – is about teachers downloading knowledge to students? It is teacher-centered. Which way of learning – teacher-centered or student-centered – is more about students deciding for themselves what they want to download, and then taking that downloaded information and changing it to fit their own needs? It is student-centered. Of course, teacher-centered and student-centered fall along a continua; they are not either/or. Even in student-centered learning, a role remains for teachers to talk, to evaluate, to demonstrate, to lead, just as we do in a teacher-centered class. However, it is a smaller part of what we do.

The importance of student-centered learning has increased today in education, due to the increased prominence of life-long learning, the idea that even after finishing our formal education, we will continue to learn for the rest of our lives. Why is life-long learning necessary? First, information continually changes, and we have to be continually learning in order to keep up with the times. Second, learning makes life exciting. According to an African proverb, “Those who have stopped learning are considered the living dead.” Third, learning can be a social activity, providing opportunities to interact and enjoy with others throughout our lives.

Quality Questions?

Questions often play a prominent role in education, especially student-centered learning. In teacher-centered learning, teachers ask most of the questions. The students usually ask questions to teachers, not to fellow students, and student questions mostly focus on details, such as “When is the quiz?” “Will this be on the exam?” “May I please use the restroom?” “Can I have an extension on the deadline?” Yes, these questions ask about important information, but do they connect with the motivations that people have for going into teaching, reasons such as making a difference and enjoying their interactions with students (Marsh, 2015)? Sadly, they do not. We teachers, not just our students, need to feel excited about our lifelong education voyage.

One category of questions unlikely to excite students or teachers are lower-order thinking questions, such as the questions earlier in the previous paragraph. Examples of lower-order thinking questions by English teachers might be reading or listening comprehension questions where the answers can be easily retrieved from the text, e.g., “What color was the cat in the story?”

In contrast, thinking questions fit well with student-centered learning. An easy way to know whether to categorize a question as a retrieval or a thinking question is whether the question goes beyond the information given (Bruner,
1957). The question about the cat’s color in the previous paragraph relies on information previously given, as the information can be retrieved from the text that students have read or listened to. Examples of questions that go beyond the information given might be “Would you like to be the cat in the story?” and “What could be a different ending to the story?” These two thinking questions fit with the student-centered paradigm because students are giving their own ideas.

A related system for classifying questions categorizes them as display or reference questions (Long & Crookes, 1986). In response to display questions, student display their knowledge, and teachers, who already know the answers, check whether the students displayed the correct answers. An example of a display question would be, “What is the correct form of the verb (like/likes) in the following sentence: ‘Everyone (like/likes) mangoes.’”

Students can also ask display questions to peers, but usually it is teachers who ask display questions. In fact, outside of teaching, do you often ask display questions? Probably not, as we do not usually ask questions for which we already know the answers. Part of the assumption behind a question is that we do not know the answer; otherwise, we would be wasting everyone’s time (Eskritt et al., 2008). That said, it might make sense for teachers and others to sometimes ask display questions to check if people already have certain useful information.

Referential questions contrast with display questions. Referential questions request information that the askers do not have; for example, if the class is discussing climate change, a referential question might be, “Have you ever done something to persuade the government to stop or reduce the use of fossil fuels?” Additionally, if the class has just watched a fictional video, a referential question might be, “How could the story have been different if it had taken place where we live?”

**Strategies for More and Better Student Questions**

What can teachers do to encourage and develop students as questioners? We need to address both the will and the skill of our students to assume this active role in their learning. Here are strategies to accomplish this.

Why Should Students Ask Questions?

Students should discuss some of the benefits of them asking questions to teachers, peers, and others.

1. Shows interest in what people are discussing
2. Allows us to clarify in case we do not understand or want to check if we are understanding; others may wish to have similar clarifications, and they will appreciate us for asking questions
3. Expresses curiosity to know more on the topic; this can promote deeper discussion.
4. Enables people to see different perspectives on the topics being discussed
5. Introduces our own perspectives and information; this may include disagreeing
6. Provides a way to learn about the sources people are using to contribute to the discussion
7. Explores applications of ideas being discussed and how they connect to other ideas
8. Asks about the past, present, and future of the ideas
9. Evaluates the ideas being presented.

Life-Wide and Life-Deep Learning

Engagement plays a big role in learning. Engagement can be viewed as a measure of student interest in what they are doing. Carl Rogers (2012) was a Humanist psychologist who talked about “client-centered therapy,” a concept which influenced the development of the similar concept of student-centered learning. As to engagement, Rogers gave an example of a youth who was very interested in his car, so interested that he looked for any opportunity to learn everything he could that would enable his car to go faster (DeCarvalho, 1991). Unfortunately, for a variety of reasons, many students do not feel engaged by the standard school curriculum. Perhaps, students might feel more engaged if formal education was more clearly integrated with students’ lives. Two concepts that might facilitate that integration can be seen as partners of life-long learning. First, life-wide learning (Zhuang et al., 2017) encourages people to explore areas outside their studies or work. In this way, they widen people’s interests and skills. Extracurricular (a.k.a., co-curricular) activities and hobbies are examples of life-wide learning. Sometimes, students’ main motivation for attending school may be these other, outside-the-mainstream activities and the social connections they provide (Seow & Pan, 2014), as these may be more engaging for some students than their regular classes.

Second, life-deep learning (Bélanger, 2016) encourages students to explore such questions as Why we are here on Earth? What makes us happy or sad, excited or bored? Is life fair? How can we achieve our life goals? Who are our role models in life? and Are people basically good, bad, or neutral? Such questions may interest students who enjoy introspection and encourage everyone, including teachers, to engage in reflection (Farrell, 2019). Reflection can be especially useful, given growing attention to students’ mental health (Johnson, 2020).

Dialog journaling (Lestari, 2020) provides a forum for questions as part of dialog between students and students, as well as between students and teachers. Asking questions when responding to others’ journal entries constitutes a form of active listening/reading that fellow journalers will want to display in order to encourage further dialoguing. This dialog normally focuses on ideas, such as life-wide and life-deep learning matters, with little or no attention to matters of form, such as grammar and punctuation. Other topics for dialog journals include what the class is studying, student feedback of the activities the class is doing, e.g., suggestions on the way that group activities are assessed, and what students are grateful for in their lives, e.g., for their cousin Adelina who helps with Internet problems (Khanna & Singh, 2021). Indeed, Khanna and Singh specifically labelled as gratitude journaling the latter topic for journal entries.
Time To Ask Questions

Students often need time to consider if they have questions and then to consider how to formulate those questions. Several strategies can be utilized to provide time for questions. One, when teachers and others ask, “Any questions?”, a reasonable amount of time should be provided afterwards, rather than just a one-second pause. This adequate timing shows that “Any questions?” is a sincere inquiry, not a bad habit, e.g., some teachers have the habit of ending almost every sentence with, “Any questions?” “Right?” “Clear?” “Got it?” “Okay?” or similar questions that may represent a genuine attempt to check whether their listeners have understood, but are not executed in a sufficiently encouraging way.

A second way to provide students time to ask questions involves asynchronous interaction, i.e., questions can come many minutes, hours, and even days later. Email communication often, although not always, takes asynchronous form, providing extra time to surface and formulate questions. As a result, asynchronous communication fits into the comfort zones of more reflective students (Nofitasari, 2021), who appreciate extra thinking time and may be uncomfortable with the ask-now-or-forever-keep-your-piece climate found in many learning situations.

Talking Chips (Warahuwena & Rijoly, 2021) offers another way to give time for questions and other communication opportunities, while at the same time encouraging patience among more impulsive students. In Talking Chips, students form groups of perhaps three or four members. Each member receives the same number of chips, usually two or three. Each time students speak, they surrender one of their chips, perhaps placing it in the middle of the group or in a cup. Students with no more chips cannot talk (this is why they are called talking chips), except to ask questions to groupmates who have remaining chips. Once everyone has used all of their chips, everyone takes back their chips and the game continues as before.

Playing Talking Chips may encourage students to ask more questions. Often, the more impulsive and/or more confident students use up their chips quickly, but still have much that they want to say. Thus, they will be encouraged to frame skilful questions which will induce their quieter groupmates to speak, thereby using up their chips and giving everyone back their initial ration of chips. Talking chips can be made of anything, from the plastic chips used in various games to pieces of discarded cardboard boxes.

Students Learning About Question Types

As discussed earlier in this article, questions can be categorized in many ways, including retrieval questions and thinking questions. Miri et al. (2007) reported that without teacher facilitation, students may be less likely to do thinking. One facilitation tool for thinking questions are question starters, beginnings of questions that can be used with any content area. Many question starters have been developed for Bloom’s Taxonomy of Cognitive Objectives, e.g., Illinois State University (n.d.). Examples of question starters for the evaluation category in Bloom’s Taxonomy include:

1. What criteria will we use to assess ____________?
2. What data will we use to evaluate ___________?
3. What choices would we have made ________________?

Here are examples of how those starters might look as completed questions. In this case, students could ask questions about the extensive reading program (Extensive Reading Foundation, 2011) in their class.

1. What criteria would we use to assess the extensive reading program in our class? For example, would we measure how many books we read, our reading comprehension, our reading speed, and/or our reading enjoyment?

2. What data would we use to evaluate our enjoyment of reading? For example, will we complete a questionnaire after each book, will we interview each other, and/or will we count how many books we read compared to a class that did not have an extensive reading?

3. What choices would we make if we could start the program again? For example, would we have sourced the books from the Xreading (https://xreading.com/) again? Would we have used M-Reader quizzes (https://mreader.org/) again?

Virelli (2006) reported a positive effect for the use of question starters and other facilitation strategies for thinking, even with kindergarten students, although it should be noted that the study did not have a control group. Thinking questions bring the class closer to real life, because even for young children, life provides opportunities for thinking questions (Nachiappan et al., 2018), such as “What game should my friends and I play?” “Should I eat the veggies on my plate?” “What should I draw today?”

Teachers as Models of Questioning

In student-centered learning, one of the ways teachers facilitate student learning is by being co-learners (Farrell & Jacobs, 2020). In other words, teachers no longer claim that they and the course materials are all-knowing. Instead, teachers acknowledge that much remains that even the greatest experts do not understand, that knowledge changes, and that controversies exist among experts. Thus, much needs to be learned, and students are invited to join teachers in communities who ask and investigate questions together. Teachers admitting what we do not know, asking questions, and showing enthusiasm for exploring those questions together with students and other provides an authenticity that may inspire students.

Grote (in press) discussed teachers being authentic with their students. She recounted how, when she was a primary and secondary school student, those teachers who shared about themselves made learning come alive and made her want to be a teacher. She quoted the famous educator, Paulo Freire, as stating, “I cannot be a teacher without exposing who I am.” However, when Grote became a teacher, at first, she was not authentic in that she kept her private and intimate life from her students, e.g., when students asked about her weekend, she avoided saying anything about her close female friend. Fortunately, Grote reflected on this, learned, and changed. When Grote became more open about this aspect of her life, she felt a palpable improvement in the classroom atmosphere, with students becoming more open on a range of topics.
Jablon (in press) demonstrated how teachers can model questioning as a manifestation of openness to learning and changing. In Jablon’s case, he is a white, middle-class teacher in a very diverse middle school in the United States who is open to learn from his students and others, especially those with experiences different from his own. For example, Jablon used to teach the novel *To Kill a Mockingbird*, in which a white lawyer defends a poor Black man unjustly accused of sexually assaulting a white woman, as a model of anti-racist literature. However, when people questioned the messages sent by the novel, Jablon listened, asked questions, and eventually changed his view. He still teaches that novel but in a different way.

**Teacher Responses to Student Questions**

How teachers respond to student questions can impact whether the student who just asked a question, as well as their peers, asks more questions and what types of questions they ask. Teacher responses involve not only what is said by the teachers but also teachers’ tone of voice, gestures, facial expressions, and actions, e.g., making a note of student questions for future changes in how a topic is taught (Walsh & Sattes, 2015; 2016). Some facilitative teacher responses include:

1. To state the obvious, we teachers should avoid laughing at students’ questions, unless they were meant to be humorous.
2. We should be enthusiastic in response to questions.
3. We should begin and/or end our response by appreciating the questions by saying, e.g., “Thanks for your question,” “I appreciate your question,” “I’m having a 2-for-1 sale on questions today; please ask more,” or “Hurray, I love questions.”
4. Achor (2018) and Jacobs and Hall (2020) offer advice for how teachers and peers might praise student questions:
   a. Praise should be sincere and deserved, not automatic, based on each student’s current level.
   b. Rather than saying, “Good question,” specific praise should be given, e.g., “I like your question because it makes me think more deeply about the issue.” This specificity provides one window to address the quality of student questions.
   c. When students study in groups, if questions emerge from group discussion, the group, rather than the individual question asker, should be praised.
   d. Praise can be followed by asking about how students developed their questions, as the process behind questions can be useful for encouraging future questions, e.g., “Can you please tell me the reasons why you said so?”
   e. Instead of judging student questions, teachers can express gratitude for questions, e.g., student questions can highlight important areas that teachers neglected to mention, or perhaps the questions touch on areas of difficulty that teachers had forgotten or had not realized were difficult.
   f. Gratitude can be expressed to the entire class, e.g., teachers can say, “I enjoy the questions this class asks, because your questions encourage me
to learn more, and they show me that you care about what we are studying.”

g. We teachers can use student questions as an opportunity to remind students of the importance of what they are learning, i.e., to show that it has meaning for students’ lives and the lives of others who can benefit from students’ increasing competencies (Frankl, 1959).

5. Teachers need not feel that we must have the answers for all of students’ questions. Instead, we can
   a. See if other students or the asker have answers or have some initial ideas that could lead to answers
   b. Ask students to investigate and report back; this should not be viewed as punishment for asking questions, but rather as contributing to the excitement of learning
   c. Highlight that much exists that even the top experts do not know, that experts disagree, and that answers can change over time.

Conducive Cultures

The overall classroom culture can impact student willingness to ask questions, as well as the types of questions asked. Many elements of classroom culture can have a beneficial impact. Inclusive classroom cultures (Putney, 2007) encourage everyone, regardless of their levels of past achievement, to feel welcome to be full participants in the class, e.g., using slogans such as “All questions are good questions” and “There are no stupid questions.” Constructivist cultures (Taylor, 1997) emphasize that learning does not take place in all-at-once, either/or manners. Instead, students’ understandings develop via a process of trial-and-error, risk taking, and successive approximations to fuller understandings often with the assistance of peers and teachers. Questions can play a major role in this development, but too often, only the high achieving students ask questions, as the lower achievers feel afraid to take the risk of exposing their ignorance by asking questions.

Learner-centered culture (Deakin Crick et al., 2007; Tarbutton, 2018) promotes an attitude that rather than classes being the teachers’ classes, with students as invited guests, classes exist to serve students and the wider world which students and teachers share. Therefore, students have not just the right to ask questions but also an obligation to ask questions as part of creating a culture conducive to seeking and sharing knowledge, plus expressing curiosity and wonder.

In positive classroom cultures (Käferböck, 2019), students and teachers value their own and others’ strengths, recognize achievement, seek meaning in what they are doing together, build relationships, look for ways to become more engaged, and express gratitude when it is due. Many strengths relate to questions. First, students’ willingness to ask questions is a strength often appreciated by both teachers and peers. Asking questions often signals engagement, and the questions one student asks are often those on the minds of classmates. Second, as discussed in an earlier section of this paper, many types of questions exist, and fluency in the various types, e.g., Bloom’s Taxonomy, constitutes a valuable skill. Third, follow-up questions deserve appreciation. For example, when one student asks a
question, a second student asking a follow-up question provides validation to and elaboration on the initial question.

Perhaps the idea of cooperative classroom cultures (Fotovatnia & Namjoo, 2013) can serve as an umbrella for the other beneficial aspects of classroom culture discussed in the previous paragraphs. The next section of this paper offers details about how cooperative learning (Johnson & Johnson, 2013), a learner-centered methodology also known as collaborative learning, might facilitate students asking more and better questions. On the topic of culture, it bears noting that the culture of the wider society beyond the classroom and education institution could also impact people’s willingness to ask questions and the kinds of questions they ask (Jacobs, 2020), although this matter is beyond the scope of the present paper.

**How Cooperative Learning Promotes Questions**

Cooperative learning has existed as an established learning methodology since at least the 1970s (Sharan, 1994). Since then, many teachers have contributed to developing ideas, including cooperative learning techniques and principles. Of course, each teacher and each class of students, at each different time, implements cooperative learning differently. Table 1 below explains eight cooperative learning principles and suggests how each of those principles might facilitate more and better student questions. The eight principles are positive interdependence, individual accountability, equal opportunity to participate, maximum peer interactions, group autonomy, heterogeneous grouping, teaching cooperative skills, and cooperation as a value. In cooperative learning, students usually learn in groups of two-four members, with groups sometimes interacting with other groups, as well as with teachers individually and in whole-class mode. Also, even in cooperative learning activities, students sometimes work alone.

| Cooperative Learning Principle | How the Principle Promotes Questioning Peers and Teachers |
|-------------------------------|--------------------------------------------------------|
| **Positive interdependence**  – Students feel as though they sink or swim together with groupmates, i.e., they feel as though what helps one member helps others, and what hinders one member hinders others. | A supportive, “One for All; All for One” atmosphere reduces anxiety about asking questions. |
| **Individual accountability** – Each group member feels pressure to do their fair share to help the group succeed, i.e., there are no sleeping partners, no free riders. | If someone is not sure they understand, they need to ask questions so as to be able to do their fair share. |
| **Equal opportunity to participate** – No one is excluded from the group interaction. Everyone has opportunities to share with the group. | Everyone is important, and everyone’s questions are important to the group. Questions constitute an |
Maximum peer interactions – A large quantity of peer interactions take place in each group and between groups, and those interactions include quality interactions, such as asking each other thinking questions, e.g., asking for reasons and for examples.

Group autonomy – Each group tries to rely on itself, rather than immediately asking for teacher assistance. Groups can also ask other groups before asking teachers.

Heterogeneous grouping – Groups reflect the mix of students within the class. This includes mixed levels of past achievement, as well as other variables such as ethnicity, religion, and socio-economic status.

Teaching cooperative skills – Many skills empower students to interact more successfully with peers and others. These skills include checking that others understand, providing reasons, disagreeing politely, asking for repetition and clarification, asking for elaboration, and thanking and praising others.

Cooperation as a Value – Positive interdependence (the first principle explained at the top of this table) extends beyond the small group of 2-4 members to encompass the entire class, school, town/city, country, world.

Student-generated questions

In teacher-centered learning, almost all substantive questions (e.g., “Can we have an extension on the assignment deadline, please?”) is not a very substantive question) come from teachers and course materials. In student-centered learning, students are invited to take more control, and that includes generating questions for themselves and peers, as well as for teachers. Exchange-A-Question is a cooperative learning technique that encourages students to create questions for each other. The steps are as follows.
1. Step 1 - The class discusses different types of questions and question starters. Students decide on what types of questions to write, and they practice writing such questions. Students also decide the topics for the questions.

2. Step 2 – In twosomes, each member works alone and writes one or two questions of the types the class chose and on the content the class chose.

3. Step 3 - Before exchanging their question(s) with their partner, students write answers for their own questions. Students write answers for two reasons. One, as students attempt to answer their own questions, they may see areas where their questions need improvement. Two, some students may enjoy playfully asking very difficult questions or questions which require very long answers. Needing to answer their own questions may encourage playfulness in other, more productive, areas.

4. Step 4 - Students exchange questions only (not answers) with their partner. They can ask if anything in the questions is not clear. Then, students write responses to their partner’s questions, and finally, they compare answers.

Variation: In groups of four, each twosome can cooperate to generate questions (with answers) for the other twosome in their foursome.

Questions can be prepared, as in Exchange-A-Question, or they can be spontaneous, as in the following cooperative learning technique, 7S (Jacobs & Zainal Abiden, 2017). The steps are below, and as with Exchange-A-Question, it may be beneficial if students spend time developing their question asking skills.

1. Step 1 – Stand - Everyone in the class stands up.
2. Step 2 – Slide – If students have separate chairs and desks, they slide their chairs under their desks so that the class has more room to move around the classroom.
3. Step 3 – Stretch – As students often spend a long time sitting, they may benefit from some quick stretching.
4. Step 4 – Sip – In addition to not moving enough, students may not drink enough water (Hecht et al., 2017). To address the need for hydration, in this step, students sip from their water bottles.
5. Step 5 – Stir – Students mix around the room. They move alone, unaccompanied by their groupmates.
6. Step 6 – Stop – The teacher or a student gives a signal, and everyone stops stirring. They form a pair with the person from another group who is standing closest to them.
7. Step 7 – Speak – Each student takes a turn to talk for a designated amount of time on a topic selected by the class. When they finish, their new partner asks at least two questions.

Notes: (a) in crowded classrooms it may be necessary to orchestrate student movement, e.g., numbering the seats, and half of the class change seats; (b) students can do a second round of stirring.

Cooperative skills overlap with language skills, which makes it especially important and especially convenient for students learning language to include cooperative skills in their curriculum. This can be done in many ways, including via the cooperative learning technique Tell/Paraphrase (MAACIE, 1998) which
works as follows with students in pairs.

1. Step 1 – One student makes a statement, such as “The new bicycle path near my home is great. I like it because it is wide, and there are many trees along the path.”

2. Step 2 – Their partner tries to paraphrase what they said, e.g., “There is a new place to ride bicycles close to where you live. Two good things about the place are that it has a lot of space, and you can see a lot of trees while you ride your bike.” “How was my paraphrase?”

3. Step 3 – The original speaker checks the paraphrase, for instance, maybe their partner misunderstood what they had said. Sometimes, misunderstandings are the listener’s fault, but other times, they are the speaker’s fault, because the speaker was not clear (Tarone, 1980). Still other times, misunderstandings are no one’s fault. If the paraphrase was not acceptable, the pair can try other communication methods, such as using drawings.

4. Step 4 – Now, the two partners change roles, and the person who spoke first is the one who listens, paraphrases, and asks about the quality of their paraphrase.

Tell/Paraphrase is actually one of a series of techniques for developing students’ cooperative skills. Others include Tell/Ask for Repetition/ Tell/Ask for Spelling. In the latter, students use the repair strategy (Tarone, 1980) of asking the people with whom they are speaking to spell words that students have trouble understanding.

**Conclusion**

This article has offered strategies for encouraging students to ask more questions and better questions, i.e., thinking questions. These many strategies have included providing time for students to ask questions, students learning about different types of questions (including questions derived from Bloom’s Taxonomy), further connecting learning to students’ lives via lifewide and lifedeep learning, students engaging in reflection and dialog journaling, teachers modelling the asking of questions, teachers responding to student questions in a promotive manner, building conducive classroom cultures, using cooperative learning, and facilitating student-generated questions. A classroom (virtual or face-to-face) alive with a plethora of thinking questions makes education more successful, more engaging, and more of a fun adventure in learning and doing for both students and teachers.

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