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USING DIGITAL STORYTELLING TO ENHANCE THAI STUDENT ANALYTICAL THINKING AND LEARNING ACHIEVEMENT BY USE OF A FLIPPED CLASSROOM ENVIRONMENT MODEL AND INQUIRY-BASED LEARNING (IBL)

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ABSTRACT

The objective of this research was to investigate how a student's learning environment (LE), the use of a flipped classroom pedagogy, Inquiry-Based Learning (IBL), and digital storytelling combined to enhance a Thai undergraduate student's analytical thinking skills and learning achievement. Therefore, from an extensive review of the literature, the authors developed a model consisting of five steps including Step 1's Engagement Stage, Step 2's Exploration Stage, Step 3's Summary Stage, Step 4's Elaboration Stage, and Step 5's Evaluation Stage. Therefore, the results of the proposed EDS5 Model (five educational development steps) have significant potential to increase a student's analytical thinking and learning achievement processes.

INTRODUCTION

In Thailand, student analytical, creativity enhancement, and critical thinking skill improvement have become a topic of numerous studies, educational reports, and government mandates (Clough, 2015). These include their importance in Thailand's 12th National Economic and Social Development Plan (2017-2021) (Baxter, 2017), as critical elements in Thailand's vision for its version of Industry 4.0 (Thailand 4.0), and for worker digital literacy in the 21st Century Thai workforce. Under Thailand 4.0, critical thinking skills are also stated to be a key pillar in the goal for a new, knowledge-based economy (Jones & Pimdee, 2017).

According to Lo and Hew (2017), teachers in increasing numbers globally use flipped classroom's popular pedagogy techniques for teaching, which often-times combines' video-based learning outside the classroom and interactive group learning activities inside the classroom (Bishop & Verleger, 2013). Simplistically stated, flipped classrooms make use of online videos to deliver a teacher's lectures before their class, while active learning and problem-solving activities are done in class. Thus, significant amounts of both teacher and student time are freed-up (Bergmann & Sams, 2009; Tucker, 2012).

One advantage often cited in the literature is that flipping a classroom increases student engagement. It can also lead to student satisfaction (Gilboy et al., 2015; Gross et al., 2015). Furthermore, we know that flipped classrooms promote more independent learners, and positive learning habits changes (Clark, 2015). Kong (2014) has also suggested that flipped learning increases digital literacy while also enhancing critical thinking skills.

However, these goals are not easy and hurdles are many, with often stated problems being Thai education's continual reliance on memorization and rote learning. Furthermore, past Thai learning models have focused on memorization through lectures, which causes classroom boredom, discouraging students to learn, leading to less class commitment. Moreover, learning approaches that only emphasize theories that preclude a student's ability to develop their analytical thinking ultimately results in lower learning achievement.

Therefore, we set out to examine the theory and literature to determine which learning models had the greatest potential in achieving higher competency levels in terms of analytical thinking and learning achievement. From this, we identified four learning approaches whose result has the potential to enhance a student's analytical thinking and learning achievement.

Inquiry-Based Learning (IBL)

Firstly, we identified and reviewed the Inquiry-Based Learning (IBL) approach, which involves students exploring, examining, and inquiring about knowledge to improve their problem-solving skills. In an IBL approach, teachers encourage students to question certain things to find answers or reach conclusions for themselves (Friesen & Scott, 2013; Kong & Song, 2013; Niyomkhan, 1988; Pedaste et al., 2015; Sund & Trowbridge, 1973).

Learning environment (LE)

Secondly, the student and the teacher's learning environment (LE) is studied. According to Brown and Elias (2012) and Sithole (2017), the organization of the classroom and the resultant students' behavior are critically important within a school, with the promotion of constructive interactions essential in achieving better student results.

A supportive learning environment also creates a positive learning atmosphere which leads to more efficient and effective learning (Fraser, 1998). Paul and

Devarapalli (2017) added that a classroom's physical environment should play a fostering role that helps mold a student's behavior and creates a happy learning atmosphere. Moreover, a supportive learning environment should provide a place that is easy to work in (quiet, controlled temperature, ergonomic seating facilities, media easy to see, etc.). Finally, the learning environment should promote each student's social, mental, physical, and emotional well-being.

The flipped classroom

Thirdly, the idea of a flipped classroom is used; this refers to when the majority of the classroom time is used for doing activities outside the classroom that facilitate the students' understanding of certain concepts to resolve problems and apply them to real situations (Abdullah et al., 2019; Bergmann & Sam, 2012; Gilboy et al., 2015; Lo & Hew, 2017; Mason et al., 2013; Santikarn & Wichadee, 2018; Wang, 2017).

Digital Storytelling

Lastly, digital storytelling is an approach in which a story is told through the use of integrated digital technologies such as images, sound, video clips, and creator voice-overs. This approach is applied to enhance the analytical and in-depth thinking skills of the students (Chan & Sage, 2019; Hussain & Shiratuddin, 2016; Kaeophanuek et al., 2019; Ohler, 2013; Robin, 2008; Songkram, 2011).

Therefore, from the literature review, we concluded there was significant support to proceed with the development of a learning model in which Thai undergraduate students' analytical thinking and learning achievement could be improved, which would ultimately lead to an increase in effective lifelong learning.

LITERATURE REVIEW

Learning Environment (LE)

The learning environment includes the surrounding states and conditions both inside and outside the classroom which is useful for learning and influences the efficiency of the student's learning (Fraser, 1998; Paul & Devarapalli, 2017). Also, according to the Glossary of Educational Reform (2014), the LE also consists of the cultures in which students learn. The term also encompasses the culture of a school or class—its presiding ethos and characteristics, including how individuals interact with and treat one another—as well as how teachers may organize an educational setting to facilitate learning.

Therefore, from the analysis of the literature and theory concerning learning environments, five types of LE were determined which can be summarized as follows (Table 1):

Physical environment

This refers to the environment physically affecting the student, which comprises the classroom, temperature, light, sound, ventilation, outside classroom conditions, building, location, etc. (Bull et al., 2013).

Psychological environment

This refers to the environment that influences feelings, mental state, and learning attitude. According to Trezise (2017), classrooms are emotional settings, with each student's emotional experience having an impact on their ability to learn, their engagement in school, and their career choices. Moreover, student learning can be affected by a variety of emotions, including anger, hope, pride, happiness, and boredom (Pekrun et al., 2002). Also, student emotions can be affected by classroom factors that include the content of their curriculum and their environment) (Brown & Elias, 2012; Sithole, 2017), individual differences between students, and external factors such as social interactions and their home environment (Pekrun & Linnenbrink-Garcia, 2014). Therefore, given the student numbers, emotional variety, and their causes, educators cannot be expected to effectively manage all of these experiences.

Social environment

This refers to the combination of the physical and psychological environment which influences the learner, i.e. the teacher (who has the relationship as professional teaching the learner) and learner, who facilitates, supports, and listens to each other's opinions (Bull et al., 2013; Glossary of Educational Reform, 2014). Other studies have also shown that individuals have a strong desire to fit in and will conform to the behavior (social conformity) of those around them (White et al., 2019). Rongjun and Sun (2013) also stated that social conformity serves as an emotional buffer to protect individuals from experiencing strong negative emotions when the outcomes are bad. In Thailand, this was also confirmed by Pimdee (2020), in which a pre-service teacher's situation (SIT) was determined to have a strong influence on their environment.

Educational environment (EE)

According to van de Ridder (2014), a safe EE is crucial for learning. This is consistent with Koriakina (2016) who stated that a university's multi-cultural information and educational environment required tolerance, regionalization, stability, and development.

Moreover, in educational Salience Theory, it is proposed that learning occurs across instances of stimulus pairings and the resultant sharing of response-eliciting processes that occur. Salience is also the degree to which a student's EE highlights a particular information gap, which is frequently used in an EE (Rumbaugh et al., 2012).

Information environment (IE)

According to Badke (2012), teachers play a significant and key role in teaching research processes and related information literacy, with education now is moving out of the library to interactive practice. Moreover, this can now become the foundation for new forms of process learning, deep learning, twenty-first-century skills, and student self-learning. These ideas are consistent with Ermolayev et al. (2019) who suggested that the IE is being upended by a newer idea which the authors call, 'information and communication pedagogical environment' (ICPE). It is also suggested that the IE is creating a new didactic model by the constant and aggressive increase of content and student motivation to consume it.

The IE also consists of hardware and software storage, how information is processed and transmitted, as well as the political, economic, and cultural conditions surrounding the accessibility of the data. Finally, EE is perceived as a set of objective external conditions and factors of social objects, which are necessary for the EE's function.

Thus, from the investigation of LE's five aspects, we concluded that the LE surrounds the teacher and student which has direct and indirect, abstract and substantial impacts on learning, learning efficiency, and changes in student behavior. Moreover, a positive LE creates a more pleasant learning atmosphere that facilitates more efficient and effective teaching and learning. Consequently, this leads to a more positive attitude towards learning, learning skills, and learning achievement (Fraser, 1998; Hiemstra, 1991; Hoksuwan, 2005; Saisamorn, 1996).

Table 1 Synthesis of the learning environment research.

Learning Environment Types	Information Sources						Researchers
	Fraser (1998)	Saisamorn (1996)	Hoksuwan (2005)	Hiemstra (1991)	Bull et al. (2013)	Total	
1 .Physical environment	✓	✓	✓	✓	✓	5	✓
2. Psychological environment	✓	✓	✓	✓	✓	5	✓
3. Social environment	✓	✓	✓	✓	✓	5	✓
4. Educational environment	-	-	-	-	✓	1	-
5. Information environment	-	-	✓	-	-	1	-

Flipped classroom

Flipped Classroom is an approach that switches a traditional learning model to an interactive learning approach. The teacher offers advice with the students applying different concepts, giving them autonomy responsibility for self-learning, as well as class participation (Abdullah et al., 2019; Bergmann & Sam, 2012; Gerstein, 2011; Gilboy et al., 2015; Lo & Hew, 2017; Mason et al.,

2013; Pahe, 2013; Santikarn & Wichadee, 2018; Schoolwires, 2013; Suthasinobol, 2015; Wang, 2017;).

Therefore, from the analysis of the literature and theory concerning flipped classrooms, steps 1 – 4 shown in Table 2 can be summarized as follows:

Step 1 Experiential engagement

In Taiwan, Lin (2019) evaluated flipped-learning methods in a learner-centered environment by integrating cooperative learning with the experiential learning model, which allowed the learners to actively engage in the learning process (Tucker, 2012; Bishop & Verleger, 2013). Additionally, cooperative experiential learning classroom goals are centered on students' autonomy development and enhancement of their higher-order thinking skills.

Step 2 Concept explorations

Outside classroom activities are teacher-developed and assigned. Normally, these activities make use of video and other forms of multimedia, which can also include assignments through Learning Management Systems (LMS) such as Moodle or Schoology. Online collaboration through the use of an LMS also enhances the flipped classroom and blended learning environment as well as digital literacy skills (Phuapan et al., 2016).

Step 3 Meaning-making

In the flipped-learning meta-analysis from Kozikoğlu (2019), it was stated that the flipped learning model (FLM) results in various positive aspects including more fun and meaningful learning. The FLM also enables a student's active participation by increasing classroom interaction. The FLM also helps develop higher-order thinking skills and positive attitudes and motivation. Finally, it allows them to progress at their own pace and while allowing them to review their lessons and knowledge through videos and other learning materials. Hence, a flipped classroom, which is learner-centered, is practical for meaningful learning to take place in the classroom (Roehl et al., 2013).

Step 4 Demonstration & application

This refers to the creative application of knowledge to real-life via the presentation process.

Therefore, a flipped classroom is seen as a teaching and learning approach that involves spending time on different activities to facilitate students' understanding, allowing them to solve problems and apply solutions to real situations with the assistance of the teacher (Kozikoğlu & Yıl, 2019). Moreover, students are autonomous learners outside the classroom. When students return to the classroom, pre-made teacher material is used to prompt and stress further understanding so that students can enhance their learning achievement and be encouraged to have a more positive attitude toward learning.

Table 2. Synthesis of the flipped classroom research.

Flipped Classroom Components	Information Sources						
	Bergmann and Sam (2012)	Suthasinobol (2015)	Schoolwires (2013)	Pahe (2013)	Gerstein (2011)	Total	Researchers
1 .Experiential Engagement	✓	✓	✓	✓	✓	5	✓
2. Concept Exploration	-	✓	✓	✓	✓	4	✓
3. Meaning Making	✓	✓	✓	✓	✓	5	✓
4. Demonstration & Application	✓	✓	✓	✓	✓	5	✓

Inquiry-Based Learning (IBL)

Inquiry-Based Learning is a 21st-century method of learning management where students explore, examine, and inquire about the knowledge that can be used to enhance their problem-solving skills. The teacher is the actor who encourages the students to ask questions to find solutions or reach conclusions by themselves (Bybee et al., 2006; Dechagupt, 2001; Duran & Duran, 2004; Duran et al., 2011**;** Institute for the Promotion of Teaching Science and Technology [IPST], 2007; Kong & Song 2013; Niyomkhan, 1988; Pedaste et al., 2015; Sund & Trowbridge, 1973Wichianchot, 1981).

Therefore, from the analysis of the literature and theory concerning IBL, steps 1 – 5 shown in Table 3 can be summarized as follows:

Step 1 Engagement

This step is used to create interest or introduce the lesson, encourage the learners to take part in the learning via proposing problems and situations. It is also a good step for use in evaluating existing knowledge. It can be used to help increase learners' interest, which can lead to learners finding solutions on their own from their research.

Step 2 Exploration

This step is used to explore ideas, set hypotheses, or explain different problems or questions. Moreover, each learner investigates a specific inquiry task, from which better questions and answers can be found.

Step 3 Explanation

This step is used to propose concrete experiences, verify facts, and encourage learners to explain their thoughts, concepts, or definitions in a manner comfortable with their language and references.

Step 4 Elaboration

This step is used to connect the established knowledge to the existing one or the concept acquired from the research in the order form a summary to show the understanding, discussion participation, and presentation, which helps the learner to strengthen their deeper and wider comprehension.

2.3.5. Step 5 Evaluation

This step is used to encourage the learners to identify what they have learned, evaluate their understanding to check the accuracy of their acquired knowledge, improve, add, and summarize their knowledge.

Therefore, IBL is a learning method where fact discovery uses problem-solving skills development. As such, IBL starts with a facts inquiry, a survey, and then research with different methods that allow learners to understand and perceive knowledge in a meaningful way. The learner is then able to research the questions posed by the teacher who encourages them to apply the thinking process to discover reasons or knowledge or guidelines for finding solutions on their own.

Table 3. Synthesis of the IBL research.

Inquiry-based Learning Steps	Information Sources						
	Duran et al. (2011)	IPST (2007)	Bybee et al. (2006)	Dechagupt (2001)	Wichianchot (1981)	Total	Researcher
1. Engagement	✓	✓	✓	✓	✓	5	✓
2. Exploration	✓	✓	✓	✓	✓	5	✓
3. Explanation	✓	✓	✓	✓	✓	5	✓
4. Elaboration	✓	✓	✓	-	✓	4	✓
5. Evaluation	✓	✓	✓	✓	-	4	✓
6. Extension	-	-	-	-	✓	1	-

Note. IPST (Institute for the Promotion of Teaching Science and Technology)

Digital Storytelling

Digital Storytelling refers to the process of telling stories through the combination of storytelling techniques and digital media, which can include text, pictures, and voice-overs to make the story more interesting. Moreover,

according to Papadopoulou and Vlachos (2014) in the 21st Century, the ancient technique of oral tradition has been replaced by various forms of multimedia digital tools.

Digital storytelling also enhances thinking skills, analysis skills, and synthesis skills from the content or the story's transformation. The creator (teacher normally) inserts questions into each of the steps in the story's progression systematically (Chan & Sage, 2019; Hussain & Shiratuddin, 2016; Kaeophanuek et al., 2019; Lambert, 2010; Ohler, 2013; Papadopoulou & Vlachos, 2014Robin, 2008; Songkram, 2011).

Therefore, from the analysis of the literature and theory concerning digital storytelling, steps 1 – 6 shown in Table 4 can be summarized as follows:

Step 1 Point of view

This is to establish the story-tellers' point of view and the clarity of the story to be presented. The answers can help the story-teller establish the frame of reference and better communicate the message so that the storyteller can accurately and concisely tell a story.

Step 2 Finding the moment

This is to discover the key aspect of a story to make it more interesting, create the theme, and set a question at the beginning of the story which would be posed to the audience before eliciting answers at the end.

Step 3 Emotional content

This is to make the audience have empathy with the story and become more immersed in the story. To make the story more realistic, it should be narrated with a certain theme.

Step 4 Spoken narrative and soundtrack

This is an attribute of the voice-over. The voice of each individual is different to help the narration of the story. Moreover, music and the soundtrack convey the mood and tone of the story.

Step 5 Seeing your story and performance

This is to consider all of the components and images to convey meaning. It should also be of inappropriate quality and quantity to improve the narration.

Step 6 Sharing your story

This is to review the entire presentation of the story, from the beginning to the end before publishing.

Thus, we conclude that digital storytelling involves telling a story by combining digital technologies as teaching tools. These tools can include images, sound, video clips, and voice-overs. Knowledge obtained from the storytelling enhances analytical thinking, especially when the content is challenging. Therefore, digital storytelling enables the learner to better understand the logic and the concept.

Table 4 Synthesis of digital storytelling research.

Digital Storytelling Steps	Information Sources						
	Papadopoulou and Vlachos (2014)	Ohler (2013)	Lambert (2010)	Robin (2008)	Lambert (2007)	Total	Researchers
1 .Point of view	✓	✓	✓	✓	✓	5	✓
2. Finding the moment	✓	-	✓	✓	✓	4	✓
3. Emotional content	✓	✓	✓	✓	✓	5	✓
4. Spoken narrative and	✓	✓	✓	✓	✓	4	✓
5. Seeing your story and	✓	-	-	✓	✓	4	✓
6. Sharing your story	✓	✓	✓	✓	✓	5	✓

Analytical thinking

Analytical Thinking refers to the ability to classify, explain, and categorize data, details of incidents or situations or to connect the relationship between the data, as well as to verify the information to improve understanding, leading to accurate decisions (Banks & Clegg 1977; Bloom, 1956; Chareonwongsak, 2003; Marzano, 2001; Marzano & Kendall, 2007; Munkham, 2004; Sariwat, 2006; Thaneerananon et al., 2016).

Therefore, from the analysis of the literature and theory concerning analytical thinking, steps 1 – 6 shown in Table 5 can be summarized as follows:

Interpretation

Chareonwongsak (2003) describes elements used in analytical thinking. These include the ability to interpret and understand what we see. Each criterion used as a benchmark for judging is the meter stick that each person creates in that interpretation which will vary according to the knowledge, experience, and values of the individual. Moreover, interpretation of experience is based on the recollection of events from firsthand experience.

Story comprehension

To think and analyze well, it is necessary to have a basic understanding of that subject. Because knowledge helps to define the scope of analysis, enumerate, and classify what it is related to. Issues concerning the number of sub-elements

are questioned, as well as how many categories are there. Additionally, one needs to know how to prioritize and know what the cause effect is. We also need to use relevant knowledge as a component of thinking. If we lack knowledge, we may not be able to analyze the reasons why this is so.

Observation and curiosity

Common aspects cited as essential for analytical thinking include curiosity, being observant, being objective, and the ability to be creative. Curiosity is the stimulus for exploration into unknown realms, which includes asking questions and digging deeper into complex issues.

Being inquisitive opens a world of possibilities and seeks rare ideas that a lack of curiosity would just pass by. Being observant includes the ability to listen and paying attention to details, targeting patterns, and collecting information through all senses. Bring objective entails the ability to focus, while keeping emotions in check, and removing any biases when assessing a situation. Creativity leads analytical thinkers to think outside the box and generate innovative ideas.

Elements analysis

Elements analysis is tasked with considering and classifying what is important, as well as determining the significance of the components of an incident using logic.

Relationship .5analysis

To establish the relationship of different attributes (whether or not they relate to one another) or whether the incidents are coincident or have conflict.

Organizational analysis

Organizational analysis looks at the ability to apply knowledge to find out the components of a situation or incident to identify which concept is used.

Therefore, it is concluded that analytical thinking refers to the ability to classify the components of information; to find establish the relationship of the information, or to determine the meaning and components of information. Analytical thinking is also able to help the students apply logic in their quest for truth, resolve problems to make evaluations, and make rational decisions that initiate learning and foster a higher level of learning achievement.

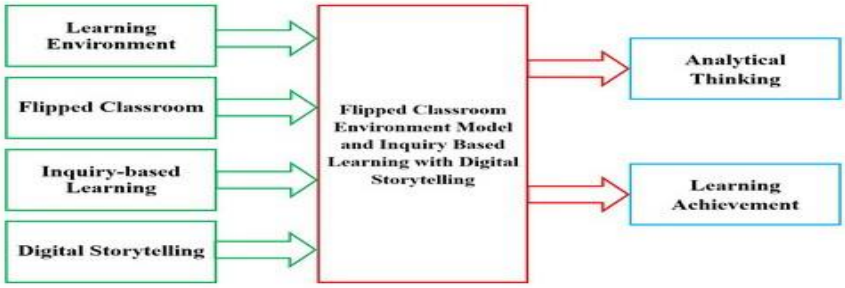
Table 5 *Synthesis of analytical thinking research.*

Figure Analytical Thinking Components	Information Sources						Researchers
	Sariwat (2006)	Munkham (2004)	Chareonwongsak (2003)	Marzano (2001)	Bloom (1956)	Total	
1. Interpretation	✓	-	✓	-	-	2	-
2. Storycomprehension	✓	-	✓	-	-	2	-
3. Observation and curiosity	✓	-	✓	-	-	2	-
4. Elements analysis	-	✓	-	✓	✓	3	✓
5. Relationshipanalysis	✓	✓	✓	✓	✓	5	✓
6. Organizational principles	-	✓	-	✓	✓	3	✓

shows the initial conceptual model for the study. In the depiction, we see how four pedagogical approaches are used to achieve the study's final objectives of improving Thai undergraduate analytical thinking skills and their learning achievement.

CONCEPTUAL FRAMEWORK

Figure 1 Conceptual framework.



METHODOLOGY

The researcher applied a systematic review of Thai and international documents, textbooks, research studies, and articles related to this study. The researcher utilized the purposive sampling method to select and then evaluate studies conducted from 1956-2020. This quantitative research applied the content analysis approach using keywords to discover five main aspects; namely, the learning environment, flipped classrooms, inquiry-based learning (IBL), digital storytelling, and finally, analytical thinking. Additional advice was sought from other faculty members, as well as outside educators.

RESULTS AND DISCUSSION

The synthesis of the draft model created from the analysis of the results of the model components to create the flipped classroom environment and the inquiry-based learning with digital storytelling to enhance the analytical thinking and learning achievement is comprised of the following five steps shown in Table 7 and Figure 2's final EDS5 Instruction Model.

Table 7 Table showing the relationship of learning steps

Learning Environment	Flipped Classroom	Inquiry-Based Learning	Digital Storytelling	**EDS5** Instruction Model Steps
1. Physical Environment	1. Experiential Engagement	1. Engagement	1. Point of view	Step 1: Engagement Stage - The learner takes part in setting the learning plan, to increase the student's interest.
2. Psychological Environment	2. Concept Exploration	2. Exploration	2. Finding the moment	Step 2: Exploration Stage - Learn and research for additional knowledge to acquire an overview of the relevant knowledge.
3. Social Environment	3. Meaning Making	3. Explanation	3. Emotional Content	Step 3: Summary Stage – From the use of logic and reason, each learner arrives at a conclusion from the relevant knowledge.
4. Educational environment (EE)	4. Demonstration & Application	4. Elaboration	4. Spoken Narrative & Soundtrack	Step 4: Elaboration Stage - The learner links existing and new knowledge to apply it to new situations and a broader pool of knowledge.
5. Information environment (IE)		5. Evaluation	5. Seeing your story and performance	Step 5: Evaluation Stage - The teacher encourages or promotes the learner to self-evaluate their newly acquired knowledge and

				competence.
			6. Sharing your story	

Step 1 Engagement stage

In Step 1 the teacher selects a method such as a flipped lesson or digital story to engage the student in the teacher's lesson. During this stage, learning tasks are identified, with input from the student sought on the best strategy to achieve the lesson's outcome and their experience from the lesson. Moreover, the process should heighten the learner's curiosity, leading to their desire to investigate the topics in greater detail individually.

Step 2 Exploration stage

This involves the process of learning and researching to obtain new knowledge to construct an overview of what is better learned. It presents an opportunity for the learner to examine the knowledge and the key aspects of the lesson to find the potential answer(s). In this stage, hypotheses are determined, and alternatives complied with different sources to obtain data for the next step.

Step 3 Summary stage

Step 3's summary stage is applied to analyze, summarize, and present the results from the exploration of the learner's discoveries. This step results in knowledge being obtained from deduction and reason. The learner has the chance to explain to reach conclusions based on relevant reasons by referring to knowledge, declaring the concept, and constructing knowledge individually.

Step 4 Elaboration stage

Step 4's elaboration stage involves the connection between the newly created knowledge to older existing knowledge. In this process, newer conclusions and situations are linked to previous perceptions. Moreover, the learner engages in discussions to form a more in-depth understanding. In this step, the learner can apply knowledge creatively, which, in turn, encourages them to develop and broaden their comprehension. From this, knowledge is broadened and analytical thinking skills are increased.

Step 5 Evaluation stage

Step 5's evaluation stage is applied to evaluate specific knowledge acquired from their learning experience. It should also be used to evaluate their understanding of what they have learned. Thus, the application of knowledge allows the learner to learn new content and principles to gain further knowledge, which can be seen as the foundation of learning. This step involves the design of learning activities that promote analytical thinking, with the intent to build an environment in which 'hands-on' learning is created.

Figure 2 The EDS5 Instruction Model

CONCLUSION

Results from the research leading to the conceptualization and development of the proposed EBS5 Instruction Model determined that there are currently four very strong pedagogical approaches in which educators can use to improve both their students' analytical skills and their learning achievement. Specifically, there is strong and lengthy support for an IBL approach, and when combined with digital media being used in a flipped classroom environment, studies indicate significant improvement in most cases in student achievement. Furthermore, the analysis also determined that IBL learning approaches used with digital storytelling enhance analytical thinking and learning achievement for undergraduate students. The model EDS5 Instruction Model emphasizes the application of a flipped classroom environment in which the lecture time is changed to accommodate for numerous, daily school activity periods. The design of the learning activities highlighted the importance of encouraging analytical thinking to enhance such skills.

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