K: Architectural Education, Digital game-based learning, H5P, Escape room, Engagement
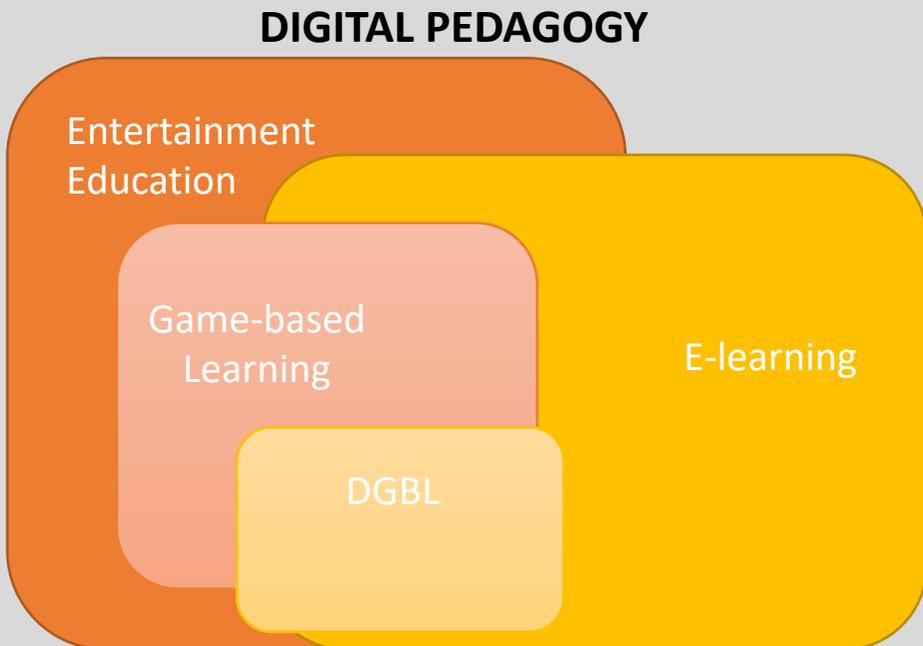
DIGITAL PEDAGOGY

Use of contemporary digital technologies

Shift from traditional methods towards more interactive and engaging approaches

Inclusive and personalized learning and teaching experience

High- quality education

DIGITAL PEDAGOGY

Entertainment Education

Game-based Learning

E-learning

DGBL

DIGITAL GAME-BASED LEARNING (DGBL)

Pedagogical approach that utilizes interactive and immersive digital games

Development of critical thinking and problem-solving skills for student-centered active learning

Figure 1. Reflection by Silvia Albano on "The Relations between DGBL and Other Educational Concepts. Reprinted from "Why So Serious? On the Relation of Serious Games and Learning" by Breuer & Bente, 2010.

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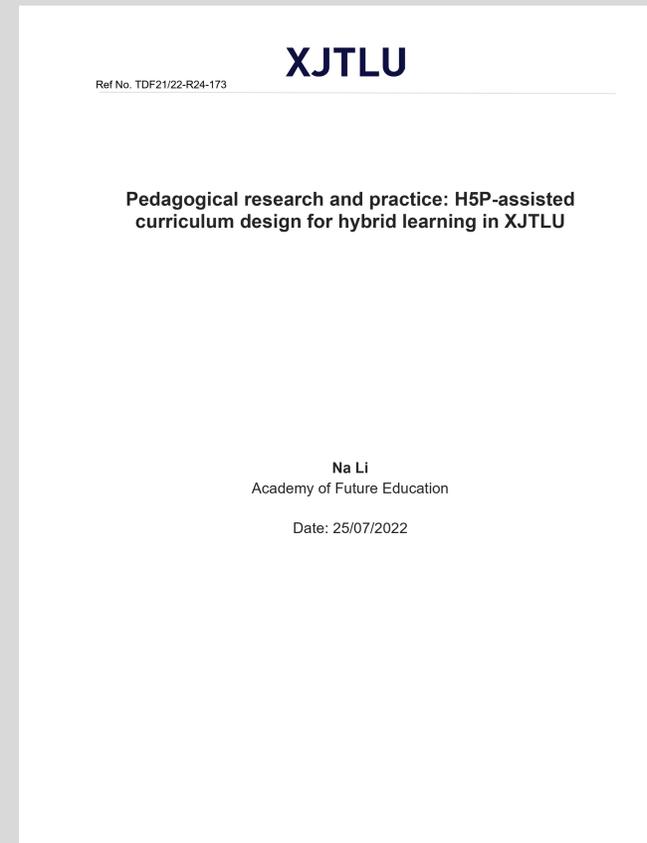
Xi'an Jiaotong-Liverpool University (XJTLU) digital game-based learning (DGBL) project team gamified the HyFlex classes using H5P and Moodle-assisted digital escape rooms and improved student engagement for synchronous and asynchronous online learning.

Whether learning can (or should) be enjoyable and gamified has been controversial in higher education for centuries. One of the biggest challenges of HyFlex learning is low student engagement. Our project is a good example of using advanced technology (**H5P and Moodle**) and creative instructional design (**digital escape rooms**) to gamify HyFlex classes.

The research findings provide solid scientific evidence to support the critical point: **higher education can be enjoyable and gamified**.

Reference: https://connect.xjtlu.edu.cn/user/na-li/educause-exemplar-xjtlu-digital-escape-room

One of the project under the umbrella of DGBL group in XJTLU is a TDF fund project:

XJTLU
Ref No. TDF21/22-R24-173

Pedagogical research and practice: H5P-assisted curriculum design for hybrid learning in XJTLU

Na Li
Academy of Future Education

Date: 25/07/2022

The main contribution of this project lies in presenting the evidence of how H5P-based learning technologies could support **innovative curriculum design** and **enhance learning and teaching in a hybrid learning environment** compared to the conventional way of teaching.

Credits: Dr. Na Li – Academy of Future Education – TDF Project Fund 2022-2024

K: Architectural Education, Digital game-based learning, H5P, Escape room, Engagement

Three Highlights of this Proposal

▼

1. Interdisciplinary collaboration across schools and departments.

2. Using the cutting-edge H5P technology and the multiscreen data sync feature of the Harmony OS for innovative digital curriculum development and technology-enhanced learning improvement in a transnational higher education context.

3. The key project outcomes (e.g., the H5P-based hybrid module template for different disciplines and the pedagogical publishing) can promote future-oriented educational innovations and enlarge the impact of educational change within and beyond XJTLU.

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▼

Department of Architecture

K: Architectural Education, Digital game-based learning, H5P, Escape room, Engagement

Qualitative case study

▼

Students' Engagement

▼

DGBL Pedagogy

▼

H5P Escape Room learning activities

▼

Game Elements

▼

Students Learning Engagement

Cognitive

Behavioural

Emotional

Social

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DESIGN PROCESS

Project-based praxis

Student-centered constructive approach

Interdisciplinary instructional methods

+ **ARCHITECTURE EDUCATION**

DP / H5P

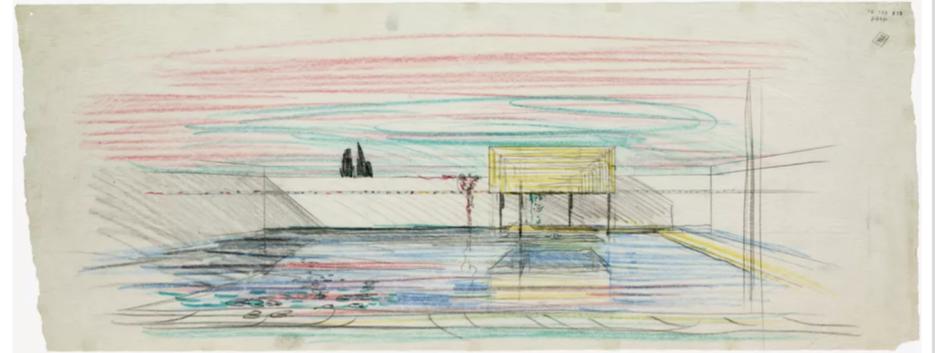Bridge the gap between theoretical concepts and real-world applications

ARC306-2223-S2-Professional Practice

Dashboard / My courses / ARC306-2223-S2

Welcome to Professional Practice

"Original drawing of the water pavilion at Brion Tomb, San Vito d'Altivole, by Carlo Scarpa, 1969–1978" (Image credit: Carlo Scarpa)

Who is an **Architect**?

Which **role** does this **professional** play in our **Societies**?

Which role do architects hold in the **Construction Industry**?

These questions represent amongst the ones that all Architecture students ask themselves during the final year.

Answering these questions will help clarifying who they will be in their upcoming **future** and, allow them to understand which **impact** they will have as professionals.

- 5- credits Lecture-based module
- Stage 4/Level 3
- 121 students

The module introduces students introduces students to the role and responsibility of the architect as a professional and in the construction industry, together with exposing them to concepts about the management of an Architecture practice in all its aspects.

DGBL & ARCHITECTURE EDUCATION

Professional Practice plays a crucial role in architecture education because helps students to understand the theoretical knowledge at a practical level, apply all the contents acquired during the academic years in the real world, develop teamwork and problem-solving skills.

These features lay a proper ground for proposing the application of DBGL in Architecture Education:

- development of students' problem-solving skills;

- application of what is learned by solving real problems from the field;

-    activation of relevant prior knowledge;

-    self-oriented trial;

-    error process.

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LITERATURE REVIEW

▼

Engagement models

Cognitive ▶ involves the mental effort investment in learning and the idea of self-regulation or the use of cognitive strategy

Behavioural ▶ related to observable behaviours of active participation, such as effort, concentration, attendance to classes, asking questions, and contributing to class

Emotional ▶ refers to feelings and emotional reactions, such as interest, enjoyment, enthusiasm, feelings of belonging, and value of learning

A MOOC (Massive Open Online Courses) engagement scale distinguished a further model:

Social ▶ centered on learner-instructor and learner-learner interactions

This study focuses on the four components of learner engagement: cognitive, behavioural, emotional, and social while examining the relationship between learner engagement and a DGBL intervention in an Architecture course.

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RESEARCH QUESTION

In what ways the use of H5P-assisted DGBL in curriculum design improves learning engagement?

Research Methodology	▶	Research setting

25%
ARC306
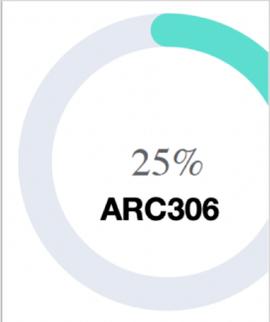
ARC306 Professional Practice

**Issues** low levels of engagement and interest by students that have become evident throughout the collection of **low attendance rates** and **discontinuous levels of engagement and interaction** with the teaching team;

additional learning and teaching issues faced during the last three years of the Covid-19 pandemic.

● Completed

XJTLU Student Module Feedback Questionnaire (...
ARC306 Professional Practice

132	Invited
1	Started
52	Responded
0	Opted Out

39% Response Rate

Proposal included among the module's contents an extra support section to help students consolidate and internalize the knowledge and learning outcomes provided by the module consciously and maturely.
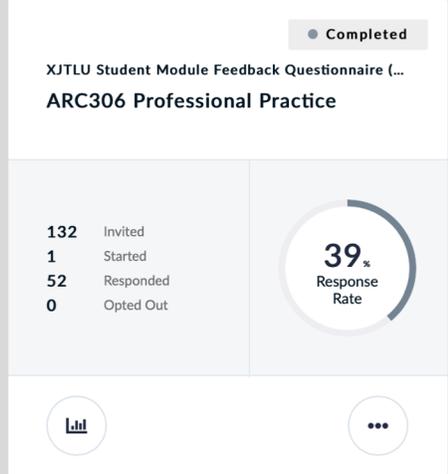
Credits:
1. XJTLU – AMS page AMS report overall module attendance ay2122
2. XJTLU Students Module Feedback Questionnaire ay2122

Lecture Presentations | Lecture & Seminar Recordin… | Summative Submissions | Additional Resources

Grp1 - Silvia Albano | Grp2 - Mona Azadian | Grp3 - Antonio Bertón | Grp4 - Jue Qiu

Grp5 - Inès Schröder | H5P Content

Credits: XJTLU – Core – ARC306 Professional practice page - ay 22-23

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H5P Content

Escape Room1
View

Health&Safety

Escape Room2
View

Restricted Not available unless: You enter the correct password

Inclusion& Accessibility

Escape Room3
View

Restricted Not available unless: You enter the correct password

Sustainability

Online Research Participant Consent Form / 在线科研参与者同意表格
View

Online Research Participant Information / 在线科研参与者资料
View

H5P research anonymous survey/ H5P研究匿名调查问卷-Before
Complete the activity

H5P research anonymous survey/ H5P研究匿名调查问卷-After
Complete the activity

Credits: XJTLU – Core – ARC306 Professional practice page - ay 22-23

The activity selected by the various package of options included in the H5P tool was that of interactive videos linked to a system of escape rooms. A series of three short videos (maximum 5 minutes each) related to the fundamental topics of the module were made, referring to the essential part of the final assignment (65% final mark) requested for completing the module successfully.

The main aim of the activity was that students watched these videos answering questions on the main topic embedded in them.
To continue watching the video and especially the following ones, the students had to provide the correct answer; otherwise, they would get stuck on the video watched.

In this way, students could resolve doubts and strengthen the essential concepts to complete their final submission and achieve the fundamental module's learning outcomes.

K: Architectural Education, Digital game-based learning, H5P, Escape room, Engagement

- The four-year full-time BEng-Architecture at the Department of Architecture at Xi'an Jiaotong-Liverpool University (XJTLU) in Suzhou (China) for the academic year 22/23.

- ARC306:Introduces students to the role and responsibility of the architect as a professional and in the construction industry, together with exposing them to concepts about the management of an Architecture practice.

- During the previous academic years, this module has recorded low levels of engagement and interest、 low attendance rates、discontinuous levels of engagement 、interaction with the teaching team.

- Through online virtual learning environment (HTML 5 Package H5P technology, namely the learning mall. A series of three short videos (maximum 5 minutes each) related to the fundamental topics of the module.

- Students watched these videos answering questions to provide the correct answer, otherwise, they would get stuck on the video watched.

- The primary motivation of the Module Coordinator was to improve students' learning experience and performance.

K: Architectural Education, Digital game-based learning, H5P, Escape room, Engagement

The non-probability sampling technique（one-on-one interviews）

Participants： 10 senior undergraduate students, 6 females and 4 males, who attended the escape room in the Architecture professional practice course.

Data collection: Qualitative data collection methods were employed with semistructured individual interviews.

Analysis: Transcriptions were coded with NVivo 12 qualitative analysis software, with a hybrid approach incorporating deductive and inductive coding. (Thematic analysis approach).

K: Architectural Education, Digital game-based learning, H5P, Escape room, Engagement

STUDENT ENGAGEMENT

Behavioural engagement
Students' observable actions and their participation and involvement in educational activities.
Students' behaviours regarding rules and expectations, and student participation in learning activities, including effort, persistence, concentration, attention, asking questions, and contributing to the discussion.

Emotional engagement
Students' affective reactions in the classroom, including interest, boredom, happiness, sadness, and anxiety.
Some conceptualize it as identification with school, belonging (a feeling of being essential to the school), and value (an appreciation of success in school-related outcomes)

Cognitive engagement
The levels of processing theory, including the idea of deep versus shallow engagement.
Deep engagement involves actively using prior knowledge and intentionally creating more complex knowledge structures by integrating new information with prior knowledge. Shallow engagement involves rote processing and other intentional cognitive actions that are more mechanical than thoughtful.

Social engagement
learner-instructor and learner-learner interactions.
It highlights the importance of collaboration, social learning, interaction and communication patterns in online discussion and motivation for attending offline meetings.

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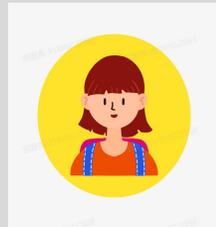
"I may use it for a long time at a time"."I will follow its order, take notes while watching the video, and then answer the questions".

Behavioral engagement

"I think H5P is a fun learning activity that makes it a bit easier to learn, you don't have to memories, and you can remember the knowledge more easily."

Emotional engagement

"Because I use it at the end of the course to help with revision, and because many of our exams are taken at the end of the course, H5P provides an active learning and independent exploration process that allows students to work independently to review their knowledge, which can help improve performance and aid our learning."

Cognitive engagement

"I feel that the most helpful thing is that I can use it to communicate with my teachers later and it has helped me a lot."

Social engagement

K: Architectural Education, Digital game-based learning, H5P, Escape room, Engagement

Dimensions	Description	Student state excerpt sample
Behavioral engagement	The behavioral engagement dimension concerns students' observable actions and their participation and involvement in educational activities. It entails time on task, students' behaviors with regard to rule and expectations, and student participation in learning activities, including effort, persistence, concentration, attention, asking questions, and contributing to discussion.	"I may use it for a long time at a time"."I will follow its order, take notes while watching the video, and then answer the questions"."When I use the H5P, I will ask questions if there's something that I don't understand".
Emotional engagement	Emotional engagement refers to students'affective reactions in the classroom, including interest, boredom, happiness, sadness, and anxiety. Some conceptualize it as identification with school, belonging (a feeling of being important to the school), and value (an appreciation of success in school-related outcomes)	"I think H5P is a fun learning activity that makes it a bit easier to learn, you don't have to memories, and you can remember the knowledge more easily.""I think it's one of the more emerging learning experiences that I've been exposed to, so I'm just interested in it, and that would then lead me to be very willing to learn about it and continue to watch these related learning videos."
Cognitive engagement	Cognitive engagement defines as the levels of processing theory, including the idea of deep versus shallow engagement. Deep engagement involves the active use of prior knowledge and the intentional creation of more complex knowledge structures by integrating new information with prior knowledge. Shallow engagement involves rote processing and other intentional cognitive actions that are more mechanical than thoughtful.	"Because I use it at the end of the course to help with revision, and because many of our exams are taken at the end of the course, H5P provides an active learning and independent exploration process that allows students to work independently to review their knowledge, which can help improve performance and aid our learning.""I think it's good to take notes while watching the video, because you might miss a section in the process, so you can go back and watch it again."
Social engagement	Social engagement is centred on learner-instructor and learner-learner interactions and highlights the importance of collaboration, social learning, interaction and communication patterns in online discussion boards, and motivation for attending offline meetings.	"I feel that the most helpful thing is that I can use it to communicate with my teachers later and it has helped me a lot." Because each group of students may have different ideas when reading the same reading material, and then you can use this platform to see different perspectives on the same point of knowledge, and then generate some collisions of ideas. The teacher will also have a better understanding of each student's ideas, because usually no one answers or interacts in class, but in this way, the teacher will have a better understanding of the students' ideas and give better feedback."

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Game elements

▼ **Motivational elements**

- influence players' thoughts, actions and reactions regarding meaningful play and learning

▼ **Interactive elements**

- provide players with opportunities to engage and participate in gameplay activities

▼ **Fun elements**

- provide players with a sense of fun and excitement

▼ **Multimedia elements**

- engage players through physical and/or multi-sensory interaction

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FACTORS THAT MAY INFLUENCE STUDENTS' ENGAGEMENT
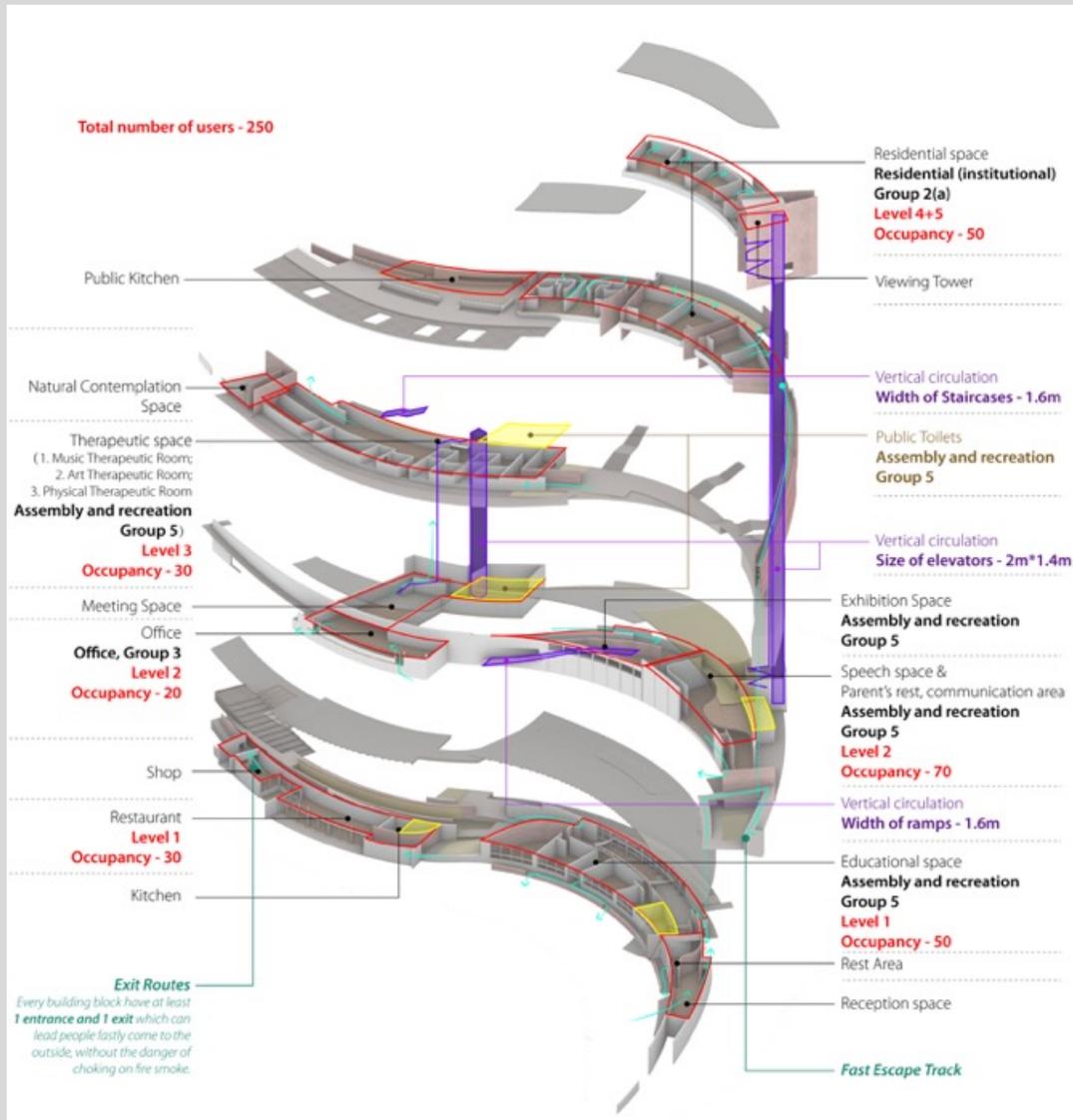
Student J: "H5P is building a full aspect scenario based on knowledge, we can get a more practical feel for how it works, and it feels very interactive, so I like it."

Student E: "As this course is mainly about how to build a building, H5P uses this interactive approach to learn a lot about building construction, such as some safety hazards and what we need to be aware of during the actual operation."

Student I: "I think it's a breakout-like format, which is quite interesting."

Student F: "The course itself is a vocational education-related course, which will help you to understand the real industry."

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CONCLUSIONS

1.These game technologies for improving the learning experience's quality and enhancing student engagement that they will not feel uncomfortable about their possible failure.

2.DGBL raises students' focus and active commitment since it facilitates learning engagingly and joyfully. Through the H5P tool, the Architecture curriculum can effectively boost students' behavioural engagement.

3. students changed their attitude regarding the interaction with tutors, peers, and the module's tasks. They started to wish to be more active during the class session sharing doubts or considerations to clarify any possible misunderstanding.

4.Digital games provide a safe and friendly environment for students.

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