

*Article*

# Integration of ChatGPT into Project-based Learning: A Course Design Framework

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## Abstract

This paper proposes the design of a course which integrates ChatGPT into Project-based Learning (PBL). It is a 12-hour Chinese language course which aims to cater to the diverse learning needs of the students in the formal Chinese language courses at the Hong Kong University of Science and Technology (HKUST). The design of the course empowers learners to set their own intended learning outcomes and to determine a topic for a group project which leads to a product based on their learning needs and interests. They can achieve the intended learning outcomes through exploring and accomplishing the project with the guidance of the teacher and the utilization of ChatGPT. The course objective, content and sequencing, format and presentation, and assessment are illustrated based on Nation and Macalister's (2010) model. Through the analysis of the findings, we have identified the various roles of learners, teachers, and ChatGPT in the course. This paper provides insights into the potential of artificial intelligence (AI) tools in language education and a useful reference for future AI-integrated course design.

## Keywords

Chinese curriculum design, Project-based Learning, ChatGPT

## 1 Introduction

ChatGPT as an artificial intelligence (AI) tool has taken the world by storm, reaching 100 million users just two months after being launched in late Nov 2022 (UNESCO, p.3). As an advanced artificial intelligence language model, the application of ChatGPT presents both challenges and opportunities in the field of education. Its use has prompted educators to reconsider issues such as teaching evaluation, academic integrity, academic norms, and personal privacy and to suggest solutions. For instance, some have revised their assessment methods by replacing computer applications with on-site pen-and-paper exams (Cassidy, 2023). Nevertheless, ChatGPT also provides opportunities for teaching and learning, particularly in language teaching. UNESCO (2023) has identified ten roles of ChatGPT in higher

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education based on its functions, including possibility engine, Socratic opponent, collaboration coach, and personal tutor. In the field of language teaching, ChatGPT can be used as a tool to help students learn more about the language. Liu et al. (2023) propose that it can assist teachers in conducting grammatical and semantic analysis, theme extraction, and other linguistic-related analysis and serve as a teaching assistant in lesson preparation.

Currently, many teachers in the field of teaching Chinese as a second language have shared their experiences of using ChatGPT. From their perspective, ChatGPT can help to prepare lesson plans and teaching materials, design exercises and tests (Cai, 2023; Wang, 2023; Yang, 2023), design classroom activities (Wang, 2023; Yang, 2023), assess students' assignments and provide feedback (Hu, 2023; Wang, 2023). From the students' perspective, ChatGPT can provide rich resources for language learning, such as providing specific contexts to help students understand the application of language points, expanding synonymous expressions, and introducing usage rules (Wang, 2023; Zhu, 2023). Furthermore, ChatGPT can improve learners' language expressions based on the needs of different scenarios and texts (Wang, 2023) and act as a personalized language partner, customizing learning plans and providing real-time practice and feedback (Hu, 2023; Wang, 2023). The current pedagogical attempts have mainly focused on ChatGPT's auxiliary application in Chinese teaching and learning. However, some studies suggest that it should form a complete curriculum design system instead of a supplementary tool (Wang et al., 2023).

After exploring the various functions of ChatGPT, this paper proposes a Chinese course design that integrates ChatGPT into project-based learning approach. In this course, ChatGPT is used throughout the entire learning process, functioning not only as an assistive tool but as a critical instrument which guides students to learn, akin to a personalized tutor and learning partner. This course design is anticipated to serve as a reference for teachers and students in various educational settings.

## **2 The Context of the Curriculum Design**

Since Fall 2022, a new Chinese language program for non-native speakers has been introduced at HKUST, offering two classes in oral communication and reading and writing, respectively. The reading and writing courses are divided into two levels: the beginner-level (for students with less than 50 hours of Chinese language learning experience) and the intermediate-level (for students with less than 100 hours of experience). The three oral communication courses are divided into the beginner-level (for students with less than 50 hours of experience), the intermediate-level (for students with less than 150 hours of experience), and the advanced-level (for students with less than 250 hours of experience). The changes to the program have resulted in changes in students' learning needs and elevated their expectations for teachers' instructional effectiveness, prompting the development of the Project-based Learning (PBL) with ChatGPT. The course design that integrates ChatGPT into Project-based Learning (PBL) serves as a supplement to the existing formal courses at HKUST. Firstly, the current courses fall short in fully catering to the individual learning needs of students. Within the current curriculum framework, students are only able to select courses that focus on either listening and speaking, or reading and writing skills. Especially for intermediate and advanced learners, the lack of reading and writing courses hinders their pursuit of skill enhancement (See "4.1 The outer circle: needs analysis"). In the authentic language communication context, possessing comprehensive language skills is often necessary; a narrow focus on specific language skills impedes students' ability to engage in real-life language interactions effectively.

Secondly, the courses fail to adequately address the diverse learning needs of students. The existing courses aim to enhance students' Chinese language skills in listening, speaking, reading, and writing, with content primarily based on basic everyday topics. However, it fails to provide

opportunities for Chinese language learning in diverse contexts such as professional, academic, and/or situations closely aligned with students' daily life. As a supplementary component to formal courses, the fusion of ChatGPT with PBL precisely addresses the individualized and diverse learning needs of students. This integration is based on the distinctive characteristics of PBL and the functional capabilities of Chat GPT.

Project-based learning (PBL) refers to “a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks (Markham et al.,2003, p.4).” Notably, one of its key features is the autonomy granted to students to select problems or topics for investigation based on their own language learning needs. This method “creates purposeful opportunities for language input, language output, and explicit attention to language-related features; e.g. forms, vocabulary, skills and strategies (Stoller,2006, p.32)”, thereby catering to the varied individual learning needs of students.

Furthermore, the student-determined project themes can be tailored to different contexts based on their requirements. For instance, one group of business students seeking to acquire vocabulary relevant to business workplace settings and communication skills may explore the topic of “Exploring the current situation and impact of cashless payments in Hong Kong.” Through conducting interviews with diverse merchants and consumers, designing Chinese questionnaires, and engaging in the exploration process, students can develop language communication skills pertinent to professional scenarios.

Moreover, in addressing the individualized and diverse learning needs, ChatGPT can serve as a valuable tool for teachers to provide personalized and diverse teaching, guidance, and feedback to students. Given the varied needs and individual differences of students, teachers may encounter difficulties in adequately preparing teaching materials that cater to their distinct requirements in the same course. The multifarious roles that ChatGPT can play help address this challenge. According to PBL, it is crucial to provide relevant language examples and feedback based on students' output to ensure that they receive comprehensible input and their language skills will be enhanced in their zone of proximal development (ZPD). As an “Exploratorium”, ChatGPT can provide the texts of varying quality based on students' ongoing queries. Additionally, as a “personal tutor,” ChatGPT can offer timely feedback to students, considerably reducing the teachers' time spent on lesson preparation and feedback provision. In addition to the aforementioned roles, we have explored various functions and roles for ChatGPT in subsequent course designs. In summary, we propose a 12-hour short course curriculum, aiming to supplement formal courses in the form of small-class teaching at the University in Fall 2023.

### **3 Theoretical Framework of the ChatGPT and PBL Integration Chinese Course**

#### **3.1 Definition and framework of PBL**

In the language teaching area, project-based learning is manifested as a learner-centered approach that draws on real-life situations and focuses on learning language content and form, as well as learning processes and outcomes. Teachers and students collaboratively construct the learning process to achieve both language and non-language learning objectives (Kemaloğlu, 2010; Stoller, 2006). Based on the above features, project-based learning in language teaching can be defined as “learners choose research topics according to their interests and conduct research on the topics in a real language environment to improve their language skills and acquire knowledge in related fields” (Liang & Lam, 2020). By integrating ChatGPT into PBL, students can determine their learning objectives, and have greater flexibility in the choice of research topics and product formats. Therefore, project-based

learning can be expanded and redefined as learners choosing learning topics and objectives based on their own learning needs and interests, conducting in-depth research on these topics in a real language environment through group collaboration, producing outcomes that enhance their language proficiency and acquiring knowledge in the related fields.

The framework of PBL of this study was adapted from the Task-based PBL model (Du, 2012) and the research conducted by Sheppard and Stoller (1995). Du (2012) proposed an eight-step Task-based PBL teaching design based on the AAU-PBL Model (the Aalborg University Model), including: 1) Considering the context, 2) Defining and communicating learning goals and outcomes, 3) Designing tasks, 4) Encouraging team work, 5) Considering learners' role, 6) Considering teachers' role, 7) Assessment, and 8) Conducting evaluation. Sheppard and Stoller (1995) pointed out that one way to maximize the potential benefits of project is to follow a ten-step process: 1) Students and the instructor agree on the ILOs and a project theme; 2) Students and the instructor determine the final outcome of the project; 3) Students and the instructor structure the project; 4) The instructor prepares students for the demands of information gathering; 5) Students gather information; 6) The instructor prepares students to compile and analyze data; 7) Students compile and analyze information; 8) The instructor prepares students for the language demands of the final activity; 9) Students present the final product, and 10) Students evaluate the project. From the above two models, we can identify four main steps for conducting PBL especially from students' learning perspective. In this research, compared with a traditional classroom, the integration of ChatGPT into the PBL curriculum affords both the instructor and students greater flexibility in determining intended learning outcomes and selecting project topics, learning materials, communicative tasks and final products. Therefore, we propose a four-step learning cycle: 1) Students set their learning goals, a project theme and final product; 2) Students structure the project; 3) Students conduct the project; and 4) Students reflect on their learning journey.

### **3.2 Framework of course design**

While there are various models of language curriculum design, such as Brown (1995), Richard (2017) and Nation and Macalister (2010), the framework proposed by Nation & Macalister (2010) (See Figure 1) is more suitable for presenting the design of the current course from the perspective of curriculum designers. Nation and Macalister (2010) systematically present the elements of curriculum design and demonstrate the relationships among these elements. In contrast, the other two models take a curriculum development perspective and consider more macro elements, which are more suitable for the macro-level curriculum development at the national or institutional level (Luo, 2015). As this study defines curriculum as a course, the framework proposed by Nation and Macalister (2010) is more appropriate for presenting the design.

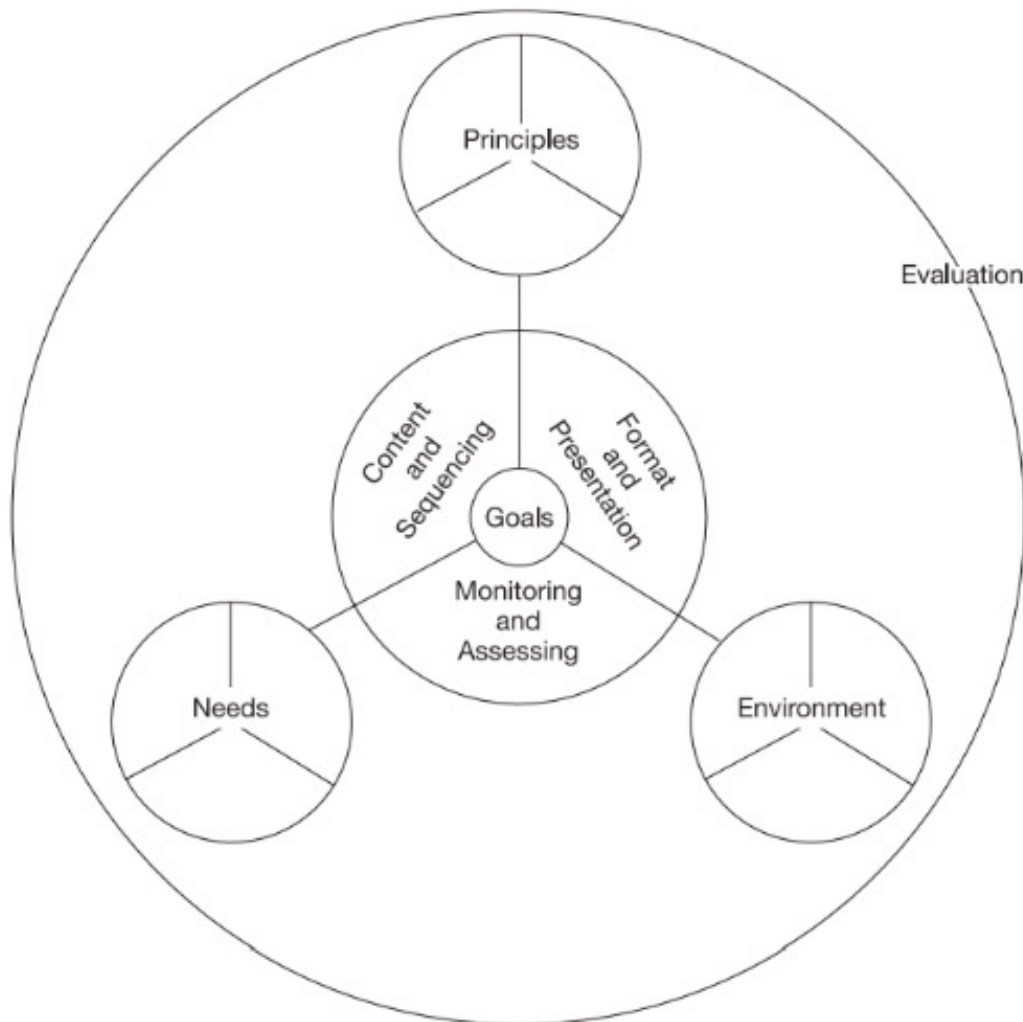
Nation and Macalister (2010)'s curriculum design model (See Figure 1) is composed of three outside circles and a subdivided inner circle. The outer circles include three components: principles, environment, and needs, which are the practical and theoretical considerations that will have a major effect in guiding the actual process of course production. Environment analysis addresses the factors of the situation in which the course will be used and determines how the course should take account of them. Need analysis includes the necessities (what the learner has to know), lacks (what the learner knows and does not know) and wants (what the learners think they need). Principles refer to the considerations of language teaching and learning research and theory which connect to the practice of designing lessons and courses.

The inner circle has four parts: goals, content and sequencing, format and presentation, and monitoring and assessment. Goals are the center of curriculum design, playing an important role in determining the content of the course its, presentation and assessment. The contents and sequencing represent the items to be learned in a course and the order in which they occur. The format and

presentation represent the techniques and types of learning activities used in lessons or units. The monitoring and assessment refer to the observing learning, testing the results of learning and providing feedback to the learners.

Figure 1

*Nation and Macalister's Model of Language Curriculum Design*



Evaluation can involve looking at every aspect of a course to judge if the course is adequate and where improvement is needed. In the following part, the ChatGPT and PBL integration course design will be presented based on the model. Since environment analysis and principle have been discussed in the context of the curriculum design and definition and framework of PBL respectively, our discussion below will focus solely on the need analysis of the outer circle.

## 4 Results and Discussion

Based on the PBL framework proposed in this article and the course design model by Nation and Macalister (2010), this section will elaborate on the course design for integrating ChatGPT with PBL in Chinese language teaching. We will follow the curriculum design model, progressing from the outer circle to the inner circle.

#### 4.1 The outer circle: Needs analysis

Hutchinson and Waters (1987) categorize needs into three types: necessities, lacks and wants. Data for these could be collected by different methods, such as expert and non-expert intuitions, interviews, surveys, language audits, observations, ethnographic methods, journals, logs, and language measurements (Long, 2005). In this study, we conducted a survey, adapting questions related to needs from previous research (Liang & Lam, 2017; Luo et al., 2022; Nation & Macalister, 2010, p.26; Richard, 2017) and informal interviews with the intermediate and the advanced learners of HKUST. The researchers invited 61 students from three advanced Chinese classes via email to participate in the need analysis survey. Ten valid responses were received, resulting in a the response rate of 16.4%. The respondents represented four different schools of HKUST and came from eight different countries and regions. Their first languages were English, German, Dutch or Korean, with their Chinese proficiency levels ranging from HSK4 to HSK9 (see Table 1).

Table 1

##### *The Respondents' Information*

<i>Student Number</i>	<i>Year of Study</i>	<i>School</i>	<i>Nationality</i>	<i>First Language</i>	<i>Current Chinese Proficiency Level</i>
S1	UG2	School of Science	South Korea	Korean	HSK 5
S2	UG1	School of Business and Management	South Korea	Korean	HSK 6
S3	UG4	School of Engineering	German	German	HSK 4
S4	UG4	School of Science	Dutch	Dutch	HSK 4
S5	UG4	School of Business and Management	Singaporean	English	HSK 4
S6	UG1	School of Engineering	Malaysian	English	HSK 4
S7	UG3	School of Business and Management	Indonesia	English	HSK 6
S8	UG3	School of Business and Management	Hong Kong	English	HSK 9
S9	UG1	School of Business and Management	Chinese	English	HSK 4
S10	UG3	School of Humanities and Social Science	Hong Kong	English	AP Chinese

In the “Lacks” category of the questionnaire, the researchers utilized the five-point Likert scale to allow students to self-assess the frequency of difficulties they encountered with each skill and language item. The scale ranged from “1” to “5,” representing the continuum from “Always” to “Never.” The average value was then calculated for each option. Lower average values indicate that students experienced difficulties more frequently with those particular skills or language items. Regarding the “Wants” section, students ranked the four skills and nine language items according to their individual needs. The researchers assigned values to the rankings, following the rule that lower rankings received higher values. The overall value was calculated for each option. Options with lower total values indicate the skills or language items that students were most eager to improve. Additionally, students indicated the desired contexts for skill improvement, which were indicated as percentages.

In terms of lacks, the results show that students rated writing and reading as the skills they often have difficulty with, followed by speaking and listening. The students rated “use different vocabulary to enrich my expression”, “the cohesion and coherence in spoken discourse” and “the cohesion and coherence in written discourse” as the top language items they often had difficulty with, followed by other six language items (See Table 2).

Table 2  
*Student's Lacks*

<i>Lacks</i>			
Skills	Average Value	Language Items	Average Value
<i>Writing</i>	2.2	<i>Use different vocabulary to enrich my expression</i>	2.2
<i>Reading</i>	2.5	<i>The cohesion and coherence in spoken discourse</i>	2.5
<i>Speaking</i>	3.1	<i>The cohesion and coherence in written discourse</i>	2.5
<i>Listening</i>	3.6	Use accurate vocabulary to express my idea	2.6
		Use different sentence patterns to enrich my expression	2.6
		Use accurate sentence patterns to express my idea	2.8
		The structure of the paragraph	3.3
		Appropriate Intonation	3.5
		Correct pronunciation	3.6

Regarding wants, the results show that the students had diverse learning needs on skills, language, and text. The students rated reading and writing as the skills they would like to improve most, followed by speaking, and listening. The context in which they would like to use the skills include workplace, daily life, and academic contexts. In the workplace, students would like to read Chinese reports, use Chinese to conduct job interviews, communicate with colleagues effectively. In daily life, students would like to read social media posts or newspaper articles, Chinese novels, write texts and essay in Chinese, and talk to friends. In the academic context, students would like to write academic papers. For the language items, most of the students would like to improve vocabulary learning, including “use accurate vocabulary to express my idea”, “use different vocabulary to enrich my expression”, and “use accurate sentence patterns to express my idea”. That was followed by the other six language items (See Table 3). The results are consistent with the informal interview results, which show that the students had quite different learning needs: some focused on reading, while others sought advanced vocabulary and speaking skills in daily life contexts. Based on the results, we could summarize their lacks, wants, and necessities (See Table 4). Meanwhile, we also notice that what students lack might not be what they want. Since this is a supplementary course, the focus would be on students’ wants. To cater to student’s learning needs, the results of the initial needs analysis suggest that listing all skills and the language items in advance might be difficult. Some of the course goals should be constructed by students.

Table 3  
*Student's Wants*

<i>Wants</i>					
Skills	Total Value	Language Items	Total Value	Text	Percentage
<i>Reading</i>	21	<i>Use accurate vocabulary to express my idea</i>	24	<i>Workplace context</i>	90.00%
<i>Writing</i>	22	<i>Use different vocabulary to enrich my expression</i>	25	<i>Daily context</i>	90.00%
<i>Speaking</i>	24	Use accurate sentence patterns to express my idea	39	Academic context	30.00%
<i>Listening</i>	33	Correct pronunciation	50		
		Use different sentence patterns to enrich my expression	52		
		Appropriate Intonation	55		
		The cohesion and coherence in spoken discourse	58		
		The cohesion and coherence in written discourse	70		
		The structure of the paragraph	77		

Table 4

*Survey Summary of Need Analysis*

<i>Lacks</i>	<i>Wants</i>	<i>Necessities</i>
Skills: Writing> Reading	Skills: Reading> Writing	The short course is a supplementary course with no required target tasks, so it will focus mainly on the students' wants rather than lacks. Since only 30% students indicated that they used ChatGPT to learn language in the survey, it is necessary to pay attention skills of using ChatGPT.
Language Items: Different vocabulary > Cohension & Cohenrence in spoken discourse = Cohension & Cohenrence in written discourse	Language Items: Accurate vocabulary> Different vocabulary	
	Context: Daily context = Workplace context	

## 4.2 The inner circle: Goals, content and sequencing, format and presentation, monitoring and assessing

### 4.2.1 Goals

In this short course, the goals mainly revolve around the intended learning outcomes students set on their own. This set of intended learning outcomes include the skills students aim to achieve after finishing the course; while the skills related to ChatGPT are common goals in the course, but the rest are different for each student. This approach can enhance student engagement and maximize learning autonomy. The intended outcomes of the course are shown as below.

- use Chinese to finish a project chosen on their own based on their learning needs and interests;
- improve listening, speaking, reading and writing skills based on the learning targets set on their own at the beginning of the course, facilitated through the applications of ChatGPT;
- write appropriate prompts to search Chinese recourses, generate Chinese texts and ideas by using ChatGPT; and
- critically analyze the Chinese language generated by ChatGPT.

### 4.2.2 Content and sequencing

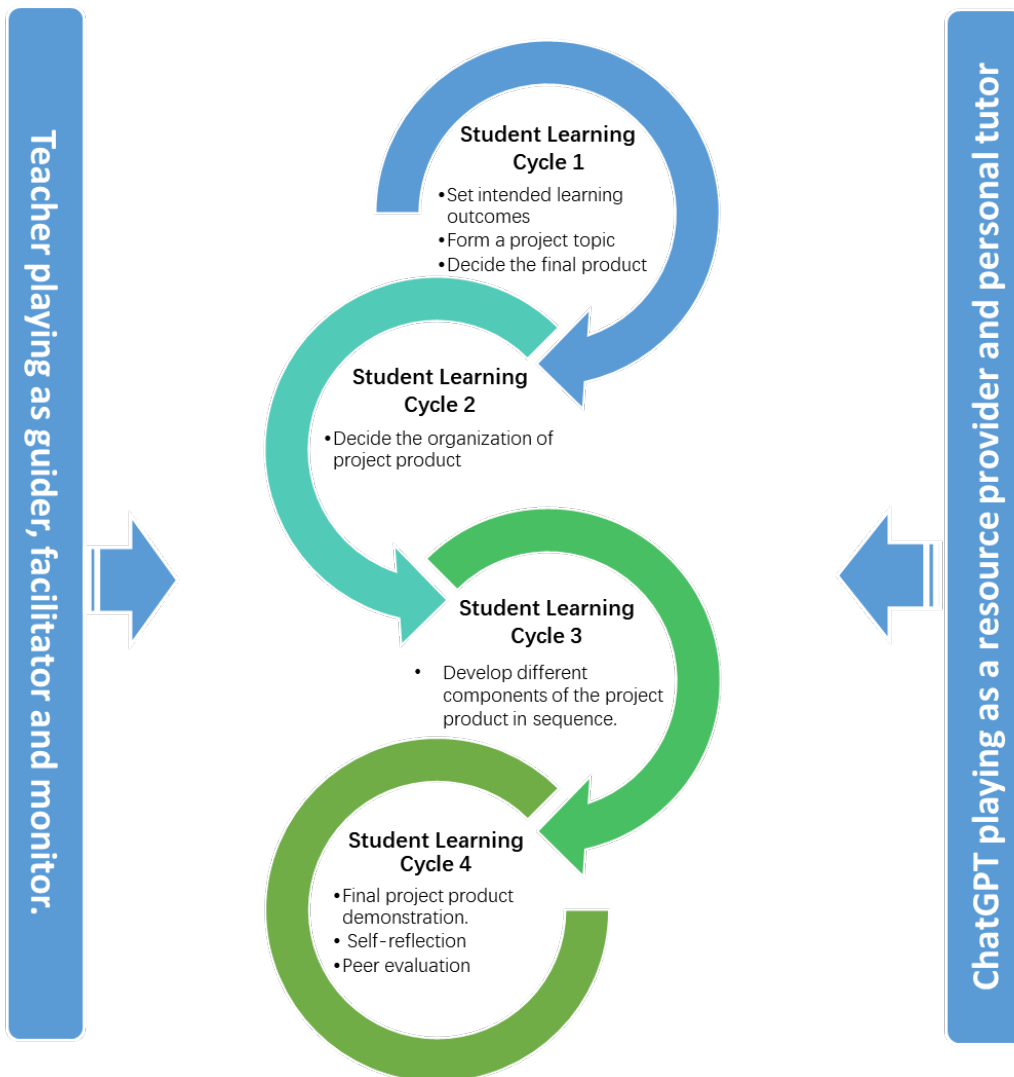
Based on the above course intended learning outcomes and the framework of PBL, the 12-hour short course will be divided into eight sessions, each lasting 1.5 hours. The content and sequencing will follow the four learning cycles, each with concrete content (See Figure 2). In the first cycle, students will be guided by the teacher and set their intended learning outcomes based on their learning needs and final products. For example, one student during the informal interview expressed his desire to develop his writing skill in an academic context. A possible project for this student could be finishing a research study and producing a research report based on a topic of interest. The learning outcomes could be: (1) Writing a research report on a chosen topic; (2) Improving reading and writing on the selected topic via the applications of ChatGPT (3) Writing appropriate prompts to search Chinese recourses, generate Chinese texts and ideas by using ChatGPT, including such aspects as research topic, background, method and findings; (4) Critically analyzing Chinese language generated by ChatGPT. In the second cycle, the student will decide the organization of the research paper guided by ChatGPT and the teacher. Meanwhile, the student could form a group with two or three classmates who are also interested in conducting the research. In the third cycle, the student could conduct the



research by going through various steps, including finalizing the research topic, background, method, findings, and conclusion. In the final cycle, the student will present the research findings and reflect on the research journey, sharing the learned insights and areas for future improvement.

Figure 2

*The Learning Cycles of the Course*


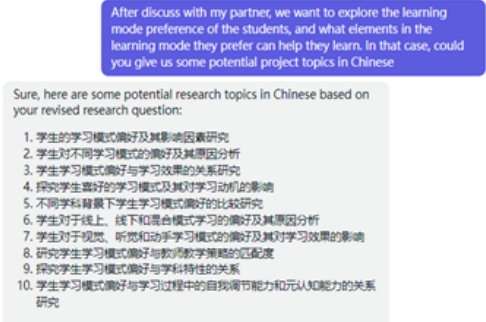


#### 4.2.3 Format and presentation

In this section, we focus on research report writing as an example to demonstrate the format and implementation of the short course, specifically the design of learning activities. The third to the seventh sessions follow the similar design, and the last session focused on assessment, which will be elaborated in section “4.3 Assessment”. Therefore, we will take the first three sessions as examples to explain the design of the learning activities. In addition, the topic of the academic papers produced by former students will be used as an example to illustrate the delivery of each specific activity.

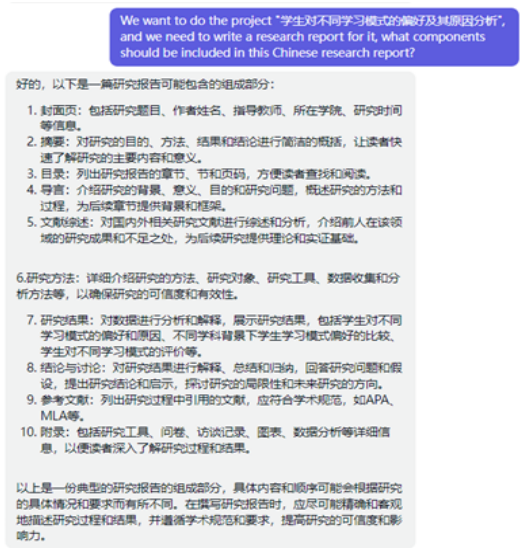
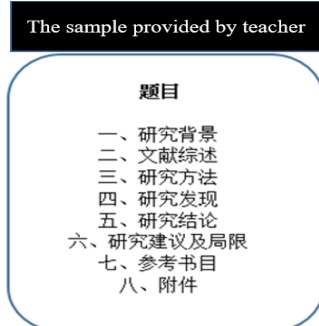
In session one, students will learn about the intended learning outcomes of the course and set their personal learning goals. Based on this, they will determine their research topics and final research products. Additionally, they will learn how to write prompts for ChatGPT and utilize it to accomplish the aforementioned tasks. The details are shown in Table 5.

Table 5  
The Format and Presentation of Session One

Teaching technique	Learning activity	The interface of the teaching process integrated with ChatGPT
Teacher explains.	· Course introduction (teaching and learning approach: PBL and ChatGPT)	
Peer discussion	· Set intended personal learning outcomes.	
Whole class sharing	· Brainstorm project ideas.	
Teacher guides students to write appropriate prompts and narrow down the topic.	· Form groups. · Learn to write prompts for ChatGPT. · Search for possible topics and decide the group topic and final product.	 <p>I'm very interesting in the different learning modes, and want to do a project about it, what topics can I choose as my project topic?</p> <p>Exploring the different learning modes is a fascinating topic, and there are numerous directions you can take your project. Here are a few ideas to get you started:</p> <ol style="list-style-type: none"> <li>1. Comparing different learning styles: Investigate the different learning styles, such as visual, auditory, kinesthetic, and read/write, and compare them in terms of their effectiveness and suitability for different types of learners.</li> <li>2. The benefits and limitations of online learning: With the rise of online learning, explore the benefits and limitations of this mode of learning. Compare it to traditional classroom learning and analyze how it affects students' academic performance and engagement.</li> <li>3. The role of technology in learning: Investigate the role of technology in learning, including how it can enhance or hinder the learning process. You can explore the use of educational apps, online platforms, and other digital tools.</li> <li>4. The neuroscience of learning: Study the latest research in neuroscience and how it relates to learning. Investigate how the brain processes information, and how different learning modes affect cognition and memory retention.</li> <li>5. Culturally responsive teaching: Explore the concept of culturally responsive teaching, which involves recognizing and valuing students' cultural backgrounds and using this knowledge to create a more inclusive and effective learning environment.</li> <li>6. Learning disabilities and accommodations: Investigate different learning disabilities and the accommodations that can be made to support students with these disabilities. You can explore topics such as dyslexia, ADHD, and autism spectrum disorders.</li> </ol> <p>These are just a few ideas to get you started, but there are many more directions you can take with your project. Consider your interests and what you hope to achieve with your research, and don't be afraid to think outside the box. Good luck with your project!</p>
Students finish their writing independently.	· Use ChatGPT to come up with 2-3 good writing examples on specific research topics.	 <p>After discuss with my partner, we want to explore the learning mode preference of the students, and what elements in the learning mode they prefer can help they learn. In that case, could you give us some potential project topics in Chinese</p> <p>Sure, here are some potential research topics in Chinese based on your revised research question:</p> <ol style="list-style-type: none"> <li>1. 学生的学习模式偏好及其影响因素研究</li> <li>2. 学生对不同学习模式的偏好及其原因分析</li> <li>3. 学生学习模式偏好与学习效果的关系研究</li> <li>4. 探究学生喜欢的学习模式及其对学习动机的影响</li> <li>5. 不同学科背景下学生学习模式偏好的比较研究</li> <li>6. 学生对于线上、线下和混合模式学习的偏好及其原因分析</li> <li>7. 学生对于视觉、听觉和动手学习模式的偏好及其对学习效果的影响</li> <li>8. 研究学生学习模式偏好与教师教学策略的匹配度</li> <li>9. 探究学生学习模式偏好与学科特性的关系</li> <li>10. 学生学习模式偏好与学习过程中的自我调节能力和元认知能力的关系研究</li> </ol>
Peer sharing & class sharing	· Share used prompts and the research topic generated by ChatGPT.	
Teacher provides guidance.	· Discuss the features of a research topic based on all the examples generated by ChatGPT.	
Peer work & Teacher provides guidance.	· Compare and analyze the topics generated by ChatGPT and samples provided by the teacher. Identify the vocabulary and language points they need to learn, such as the usage of“ 探究 ”(investigate)、“ 影响 ”(influence)、“ 分析 ”(analyze)、“ 研究 ”(research).	
Individual work and group work	· Assignment: Use the skill of prompt writing learned in class to search for the structure of a research report.	

In session two (See Table 6), students will establish the structures of their research reports based on the topic they have determined in session one. By comparing the structures generated by ChatGPT and the sample provided by the teacher, they can learn the appropriate structure for their project genres and create the structure for their own projects.

Table 6  
*The Format and Presentation of Session Two*

Teaching technique	Learning activity	The interface of the teaching process integrated with ChatGPT
Peer sharing & class sharing	<ul style="list-style-type: none"> <li>Share prompt writing ideas.</li> </ul>	 <p>The screenshot shows a blue prompt box with the text: "We want to do the project '学生对不同学习模式的偏好及其原因分析', and we need to write a research report for it, what components should be included in this Chinese research report?". Below it is a list of 10 components for a research report in Chinese, including cover page, abstract, table of contents, introduction, literature review, methodology, results, conclusion, references, and appendix.</p>
Peer work	<ul style="list-style-type: none"> <li>Revise prompts and select the best result for the structure of a research report.</li> </ul>	
Peer work and the teacher provides guidance.	<ul style="list-style-type: none"> <li>Compare and analyze the structures generated by ChatGPT and the sample provided by the teacher to identify the structure of an academic paper.</li> </ul>	
Group work	<ul style="list-style-type: none"> <li>Write the structure of the research report.</li> </ul>	 <p>The screenshot shows a list of sections for a research report: 题目 (Title), 一、研究背景 (Research Background), 二、文献综述 (Literature Review), 三、研究方法 (Research Methodology), 四、研究发现 (Research Findings), 五、研究结论 (Research Conclusions), 六、研究建议及局限 (Research Recommendations and Limitations), 七、参考书目 (References), 八、附件 (Appendix).</p>
Individual work	<ul style="list-style-type: none"> <li>Assignment: Use the skill of prompt writing learned in class to generate the possible content of the first part of a research report (Research background).</li> </ul>	

In session three (See Table 7), students will complete the content of the first part of their research reports. By comparing the different versions of the content (those generated by ChatGPT, their own creations, and the sample provided by the teacher), they can identify the appropriate content organization and language forms used in this part. Following this, the corresponding language exercises provided by the teacher can help them enhance the application of the language points learned on their own. They can accomplish the research background, which constitutes the first part of the project product.

Table 7

*The Format and Presentation of Session Three*

Teaching technique	Learning activity	The interface of the teaching process integrated with ChatGPT
Engage in group work using the worksheet provided by the teacher. List the requirements for comparison and analysis (See Appendix 1)	Compare and analyze two good writing examples of research background either generated via ChatGPT or written by the students together with group members to identify the appropriate structure of research background and language used in research background writing.	<div data-bbox="911 689 1449 1294"> <p><b>Version 1</b></p> <p>作为学生，我们不断寻求改进学习方法的途径。自疫情以来，我们不仅接触到了线上学习，也体验了传统教育中的新型教育模式，如线下学习和混合式学习等。在日常生活中，我们也会讨论各种不同的学习模式。例如，昱懿更喜欢线下学习，因为上课时较少干扰，能让她更专注于学习。然而，乐融更喜欢线上学习，因为这种模式能让她更有效地安排自己的自习时间。不仅如此，学生对于不同的学习模式也会有个人的偏好，例如个人及团体活动的课程安排等。如果我们想要开发一种新的学习模式，我们需要了解不同的学习模式的特点和效果。因此，我们希望探究学生对于学习模式的偏好以及提高学习效率的特点。本研究具体探究以下问题：1. 学生偏好哪种学习模式？2. 学生为什么会在这种学习模式产生偏好？</p> <p>在这一背景下，我们的研究旨在深入了解香港科技大学学生对不同学习模式的偏好及其原因。通过采用问卷调查和访谈相结合的方法，我们将调查学生对于线上、线下和混合式学习模式的偏好和原因，并分析不同学科背景下学生学习模式的异同。同时，我们将参考国内外的相关研究成果，以拓展研究视野和深化研究贡献。</p> <p>本研究的成果将有助于了解香港科技大学学生的学习需求和动机，为学校提供更加精准的学习支持和教育教学改革建议。此外，本研究还可以为学术界提供关于学习模式研究的新思路和新方法，为学科的发展做出贡献。通过采用系统性和综合性的研究方法，我们将确保研究结果的可靠性和有效性。最终，本研究将为香港科技大学学生和教师提供更好的学习和教学体验，为学校的发展和国际化提供有力支持。</p> </div> <div data-bbox="911 1305 1449 1825"> <p><b>Version 2</b></p> <p>随着信息技术的飞速发展和全球化的加速，香港科技大学作为一所国际化、研究型的高等教育机构，深受学生和教师的欢迎。然而，随着学习模式的多样化和学生需求的不断变化，学校面临着越来越多的学习模式选择，包括线上、线下和混合模式。尽管学校已经采取了一系列措施来满足学生的学习需求，但是目前对于香港科技大学学生学习模式偏好和原因的研究还比较有限。因此，本研究旨在探究香港科技大学学生对不同学习模式的偏好及其原因，并比较不同学科背景下学生学习模式的差异。本研究将采用问卷调查和访谈相结合的方法，以获取学生的学习模式偏好和原因，并分析不同学科背景下学生学习模式的异同。同时，本研究还将借鉴国内外相关研究成果，以拓展研究视野和深化研究贡献。</p> <p>在这一背景下，本研究具有重要的意义。首先，通过深入了解香港科技大学学生的学习模式偏好和原因，我们可以更好地了解学生的学习需求和动机，为学校提供更加精准的学习支持和教育教学改革建议。其次，本研究还可以为学术界提供有关学习模式研究的新思路和新方法，为学科的发展做出贡献。最终，本研究将为香港科技大学学生和教师提供更好的学习和教学体验，为学校的发展和国际化提供有力支持。在研究过程中，我们将借鉴相关学科的理论和方法，采用系统性和综合性的研究方法，以确保研究结果的可靠性和有效性。本研究的成果将有助于建立香港科技大学学习模式的理论框架和评价体系，为高等教育的发展提供有益参考和借鉴。</p> </div>

Engage in group work with the provided worksheet and teacher guidance. List the similarities and differences of the structure; understand the requirements for the research background writing with teacher guidance. (See Appendix 2)

- Select the best one from group sharing, compare and analyze it with the sample provided by the teacher to clarify the structure of a research report as required for the course and reinforce the language skills learned from the last step.
- Language guidance focuses on the context and culture elements of the language used in the research background.

The teacher provides the learning materials (See Appendix 3)

- Individual practice on language forms. For example: the teacher can provide some exercises related to connectives expressing causal and hypothetical relationships between clauses, which are often used in the writing of research background.

Individual and group work

- Students finish the first part of writing.

Whole class sharing

- Students share the main language points learned through the writing process.

#### The best version selected by the students

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在这一背景下，我们的研究旨在深入了解香港科技大学学生对不同学习模式的偏好及其原因。通过采用问卷调查和访谈相结合的方法，我们将调查学生对于线上、线下和混合式学习模式的偏好和原因，并分析不同学科背景下学生学习模式的异同。同时，我们将参考国内外的相关研究成果，以拓展研究视野和深化研究贡献。

本研究的成果将有助于了解香港科技大学学生的学习需求和动机，为学校提供更加精准的学习支持和教育教学改革建议。此外，本研究还可以为学术界提供关于学习模式研究的新思路和新方法，为学科的发展做出贡献。通过采用系统性和综合性的研究方法，我们将确保研究结果的可靠性和有效性。最终，本研究将为香港科技大学学生和教师提供更好的学习和教学体验，为学校的发展和国际化提供有力支持。

#### The sample provided by the teacher

##### 香港本地中学与国际中学教育的差异

2016年，一个英国电视节目“我们的孩子足够坚强吗？”引起广泛关注。在节目里，五位中国教师被邀请到一所英国学校对五十个九年级的中学生进行教学。这个实验的结果显示，接受中国式教育的学生成绩比其他学生的成绩更好。这部影片引发了研究者对东西方教育差异的兴趣。

香港是一个具有多元文化的社会，香港的人口除了包括土生土长的本地人外，还有不少来自全球不同国家的人。因此，香港的教育选择也十分多元化，学生可以根据自己的背景选择就读国际学校或者本地学校。一般来说，香港的高中生可以在本地学校选择完成香港中文文凭，也可以在国际学校修读国际文凭大学预科课程 (International Baccalaureate)，简称国际文凭，报考大学课程。大众经常对本地中学与国际中学这两种教育体系进行比较。许多人认为国际中学的教育比较轻松，规则比较宽松，学生拥有更多的自由和空间；本地中学则相反，教育比较严格，课堂安静，学生有大量的作业和考试。如果能深入了解香港本地中学与国际中学教育的差异以及这些差异对学生学习的影响，那么就能为学生或家长选择学校提供参考。因此，本研究希望探究：第一，香港本地中学与国际中学的教育在课程设计、学习方式、师生关系和教学环境等方面有什么差异？第二，为什么会有这些差异？第三，这些差异将对学生的学习产生什么影响？

### **4.3 Assessment**

The assessment of PBL consists of both formative and summative formats. For the formative assessment, teachers provide feedback on each step during the project. For example, in the process of conducting a research study and writing a research report, students will finish research background, method, findings, and conclusion in sequence. After completing each step, they will submit the writing product, and the teacher will provide feedback on each product. In this course, students are encouraged to give peer feedback on use of ChatGPT, especially prompt writing.

The summative assessment generally includes student's presentation of their final product and reflection on the study (Alan & Stoller, 2005). For this short course, we design the final assessment as two parts: 1. Final product presentation and sharing on language, skills and strategies students have mastered; 2. Learning Journey Reflection focusing on evaluating whether students have achieved the intended learning outcomes, their experience of using ChatGPT and PBL, and suggestions for improving their projects and learning.

### **4.4 The role of students, teacher and ChatGPT**

In this short course, students are the center of learning not only due to the adoption of PBL but also because they can set their own learning outcomes. They are involved in the curriculum design. Hence, we define the students' role as the owner of learning. Teachers are the guide who provides guidance for students who have questions, especially those on the texts generated by ChatGPT. When students come to class with questions, it will improve the effectiveness of teaching and students' engagement. The teacher is also a facilitator, supporting students in controlling and owning their learning process; The teacher provides the learning conditions for students to finish their projects successfully. The teacher is also a monitor who tracks the progress of students' projects and provides language learning materials to enhance skill acquisition beyond content understanding.

ChatGPT is a component of the course since it could provide resources normally prepared by teachers, such as examples of research topic, research backgrounds, and written products for research projects. The teacher could not tailor-make the materials for each group based on their topics because of the time constraints in teaching, whereas ChatGPT could provide all personalized answers based on each student's specific project topic. ChatGPT plays the role of a teaching assistant. As mentioned in UNESCO (2023, p.9), ChatGPT acts as an Exploratorium which helps students explore and interpret data. Gilley (2023) reported that ChatGPT had offloaded a lot of his work:

Getting assistance from ChatGPT has saved me time and brain space. It has eased the load for me as a teacher and provided a resource that allows me to engage with my students more fully. Most of all, it's made project-based learning sustainable for me as a teacher.

ChatGPT also acts as a personal tutor, providing immediate feedback on students' language usage, and can act as a study buddy when helping students reflect on learning materials. However, ChatGPT could not replace the teacher since it could not provide accurate guidance based on students' performance in class, address their questions on their project, or accurately interpret materials it generates.

## **5 Conclusion**

Suppose there are 20 students divided into five groups with different learning goals and language proficiency levels. It is hard to find a course which can accommodate the learning diversity and individuality in a formal language curriculum. With the integration of ChatGPT with PBL, the constructive curriculum could be a practical one. PBL can cater to diverse learning needs, while

ChatGPT can provide tailored resources and feedback. The combination can foster deep learning and alleviate teachers' workload, allowing them to focus more on language teaching.

In line with Spencer (2023) who commented that “In a world of AI, our students need Project-Based Learning”, we recognize the benefits of integrating AI with PBL. First of all, ChatGPT can provide data, analysis and opinions. However, research shows that “deep understanding occurred when a learner actively constructs meaning based on his or her experiences and interaction in the world, and that only superficial learning occurs when learners passively take in information transmitted from a teacher, a computer, or a book “(Krajcik & Blumenfeld, 2005, p.318). PBL provides students with opportunities to conduct active construction. At the beginning, students need to decide a real-world topic and explore it systematically. Throughout the learning process, they are immersed in authentic and real-world contexts, engaging in the inquiry-based activities to build up their language learning skills and knowledge. This active construction and situated learning experiences can promote deep learning that ChatGPT cannot provide. Secondly, when students conduct a project to explore their question or topic, ChatGPT is a good resource provider and guide. It addresses individual learning needs in a classroom, offering benefits to each student. It can provide information, data and texts based on each student's needs. It also provides individual feedback on students' written products. In this study, students reported that they benefited from ChatGPT's capacity for immediate responses and its ability to engage in follow-up discussions.

ChatGPT is also a pedagogical tool. In the curriculum design, we view ChatGPT as a trigger for students' learning. Since students realize the limitations of the materials provided by ChatGPT, they have questions about the content. These questions create opportunities for effective teaching by the teacher. When using ChatGPT for language learning, students have reported that ChatGPT might provide contradictory information, leading to confusion. Students need to know when the information is accurate and when it is not. “Doubt is a valuable part of learning; when students have a big question, they will learn more; whereas when they have fewer questions they learn less. (Huang, 1676)” Viewing ChatGPT as a pedagogical tool, we recognize its potential to engage students in learning.

ChatGPT can reduce teacher's workload, allowing them to focus more on language teaching. In a class with varied topics and formats, ChatGPT, together with PBL, provide s guidance and recourses, freeing the teacher to focus on language teaching instead of the content and teaching materials preparation. PBL empowers students to define their learning objectives and outcomes, while ChatGPT provides each group with tailored g ideas and resources. Students appreciated ChatGPT for its ability to give numerous examples and create endless practice opportunities with instant feedback. The teacher's role is to guide students in identifying the gaps between their own resources and those provided by ChatGPT, as well as between ChatGPT and local expressions, facilitating students' learning of language through a comparative process.

## Appendix 1

Part 1: Please compare the two writing examples generated by your group members or ChatGPT.

Can you find their similarities in the following aspects and share with your group member which version is better?

	Version 1	Version 2
Generated/Written by		
Aspects of content included		
Vocabulary		
Sentence pattern		

Part 2: Please select a better example and list the reasons in the table below. Then, share with your groupmates. The better one is Version 1/ Version 2 (Put down a “√”)

Reason
Content structure:
Vocabulary:
Sentence pattern:

## Appendix 2

Please compare the best version you have chosen, and the sample provided by the teacher. Can you find their similarities and differences in the following aspects?

	Items	The best version you have chosen:	The sample provided by the teacher:
The similarities	1. Content structure: 2. Vocabulary: 3. Sentence pattern:		
The differences	1. Content structure: 2. Vocabulary: 3. Sentence pattern:		

## Appendix 3

请写出以下两则“研究背景”中相关词语的同义词。

研究背景一：

如果\_\_\_/\_\_\_能深入了解香港本地中学与国际中学教育的差异以及这些差异对学生学习的影响，那么就能为学生或家长在选择学校时提供参考。因而\_\_\_/\_\_\_/\_\_\_，本研究希望探究：香港本地中学与国际中学的教育在课程设计，学习方式、师生关系和教学环境等方面有什么差异？为什么会有这些差异？这些差异将对学生的学习产生什么影响？

研究背景二：

如\_\_\_/\_\_\_能深入了解香港本地中学与国际中学教育的差异以及这些差异对学生学习的影响，就\_\_\_/\_\_\_能为学生或家长在选择学校时提供参考。因而\_\_\_/\_\_\_：本研究希望探究：香港本地中学与国际中学的教育在课程设计，学习方式、师生关系和教学环境等方面有什么差异？为什么会有这些差异？这些差异将对学生的学习产生什么影响？

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# 融合 Chat GPT 与项目式学习的中文课程设计框架

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## 摘要

本研究旨在提出一个将 ChatGPT 融合到项目式学习中的短期汉语课程设计框架。该课程共 12 小时, 旨在满足香港科技大学学生多样化的学习需求, 尤其是他们在正式课程中无法实现的个体需求。课程初始阶段, 学生可以自主设定预期学习成果, 并据此确定一个小组成员皆感兴趣的项目主题及最终产出成果。此后, 学生会运用 Chat GPT 进行内容和语言方面的探索, 并在教师的指导下完成项目。本文基于 Nation 和 Macalister (2010) 的语言课程设计模型, 详细论述了课程目标、教学内容与组织、学习活动, 以及评估方式。在研究发现中, 本文总结了学习者、教师和 ChatGPT 在课程中所扮演的角色, 据此分析了人工智能 (AI) 工具在语言教育中的潜力, 并为未来整合 AI 的中文课程设计提供了参考建议。

## 关键词

中文课程设计, 项目式学习, ChatGPT

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