



# Application of College English Teaching Based on Human-Machine Collaboration

## —Taking the Teaching of “New Target College English Series: Comprehensive Course 2” as an Example

Qi Xu

Foreign Languages Department, Zhejiang Yuexiu University, Shaoxing, China

Email: 228827208@qq.com

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### Abstract

Under the backdrop of modern industrialization, human-machine collaboration has found extensive applications in various fields such as manufacturing, healthcare, and agriculture. In the education sector, human-machine collaboration is beginning to transform traditional teaching and learning methods. This paper aims to discuss how large language models can be applied to college English teaching. It primarily explores the application paths, innovative methodologies and drawbacks of large language models in teacher instruction and curriculum development. It also highlights the future research and development directions for college English teaching in the context of artificial intelligence.

### Subject Areas

Educational Reform

### Keywords

Human-Machine Collaboration, Large Language Model, ChatGPT3.5

## 1. 引言

人机协同模式是指在回应问题、完成的过程中，充分发挥人与机器的各自优势的合作模式，包括人机交互、人机交融和人机共创三个阶段[1]。人机协同的概念最早是由美国心理学家和人机交互领域的先驱之一，赫伯特·西蒙(Herbert A. Simon)提出的。西蒙在 20 世纪 60 年代和 70 年代的研究中，探讨了人类与计算机之间的合作关系，强调了人机协同在决策、问题解决和学习等方面的重要性。以 ChatGPT 大语言模型为代表的生成式人工智能

兴起，加速了智能时代的到来。

大语言模型(**large language model**, 简称 LLM)是指能够理解和生成人类语言的强大计算机程序。这些模型通过大规模的数据训练，能够自动生成类似人类所使用的自然语言。大语言模型的发展可以追溯到早期的统计语言模型，但近年来，随着深度学习和神经网络技术的迅速发展，大语言模型取得了巨大的进步。在大型语言模型的发展中，OpenAI 的 GPT-3.5 模型是一个重要的里程碑。GPT-3.5 是一种基于人工神经网络的语言模型，训练了数千亿个参数，可以生成高质量的文本，并在多个自然语言处理任务上表现出色。通过不断优化和扩展，大语言模型已经成为当今人工智能领域的重要研究方向，有着广泛的应用前景。

面对信息全球化的挑战，我国在 2012 年 3 月，由教育部出台《教育信息化十年发展规划(2011~2020)》这一重要指导文件。文件指出，要推进优质教育资源的建设与共享，将信息技术广泛运用于教育教学中，创新人才培养模式。《大学英语教学指南(2020 版)》中提到各高校应充分利用信息技术，积极创建多元的教学与学习环境。鼓励教师建设和使用微课、慕课，利用网上优质教育资源改造和拓展教学内容，实施基于课堂和在线网上课的翻转课堂等混合式教学模式，使学生朝着主动学习、自主学习和个性化学习方向发展。通过建立网上交互学习平台，为师生提供涵盖教学设计、课堂互动、教师辅导、学生练习、作业反馈、学习评估等环节的完整教学体系。教学系统应具有人机交互、人人交互功能，体现其易操作性、可移动性和可监控性等特性，允许学生随时随地选择适合自己水平和需求的材料进行学习，能记录和监测学生的学习过程，并及时提供反馈信息[2]。

人机协同是人工智能未来发展的重点。但是，当前人机协同在教育领域的研究成果较少，主要聚焦于以下方面：① 智能教育时代人机协同的智能结构。祝智庭等[3]认为，教育人工智能从“支持智能”阶段过渡到“增强智能”阶段，最后达到“人工协同智能”阶段。② 人机协同促发教师角色的转变。余胜泉[4]提出人机协同教学的分析框架，将人工智能和教师之间的协同关系分为 AI 代理，AI 助手，AI 教师，AI 伙伴四个阶段。③ 人机协同在教育教学中的应用。王良辉[5]等提出人机协同的精准教学模式。

学生主体意识的激发是人机协同教学，乃至所有教育活动所应指向的努力方向。目前大学英语教育大多以集体教学为主，人们逐渐发现仅仅依靠大班教学不能实现学习者潜能的最大化发展，因为每位学习者都有不同的认知风格和认知水平。人机协同教学是帮助学生建立主体意识、激发学习潜能的核心和突破口。本研究主要聚焦大语言模型在大学英语课程《新目标大学英语·综合教程》中的应用，探讨 LLMs 介入对英语教学内容设置和教学组织方式的影响，并通过案例展示它在教学中的潜在应用价值。

## 2. 大语言模型在外语教学中应用

### 2.1. 大语言模型赋能外语教师教学

作为 ChatGPT3.5 这样的大语言模型，可以为教师教学提供多方面的赋

能，例如：1) 教学资源 and 资料：提供丰富多样的教学资源 and 资料，包括课程教案、教学设计、教学素材等，帮助教师更好地准备 and 设计课程。2) 个性化教学支持：基于学生的学习需求和特点，为教师提供个性化教学建议 and 指导，帮助他们更好地调整教学策略 and 方法。3) 作业 and 评估辅助：提供自动生成的作业题目 and 评估标准，帮助教师更高效地布置作业 and 进行评估，节约时间 and 精力。4) 教学辅助工具：提供各种教学辅助工具，如语言翻译、语法检查、拼写检查等，帮助教师提升教学效率 and 质量。5) 答疑 and 辅导支持：提供智能问答系统 and 在线辅导平台，帮助教师回答学生的问题，解决教学难点，提供个性化辅导服务。通过这些方式，大语言模型可以为教师教学提供更多的支持 and 赋能，帮助他们更好地应对教学挑战，提升教学效果，提供更优质的教育服务。

## 2.2. 生成式人工智能支持下人机协同英语教学的基本路径

浙江越秀外国语学院大外部教师以《新目标大学英语·综合教程》unit 7 *Between Real and Virtual* 为例，引导学生分组使用 ChatGPT3.5 智能工具。在教师指导和小组讨论基础上，通过多轮次的人机对话与探究，逐步优化交互提示语，协同完成查找资料，同义词辨析，写作文等学习任务。充分发挥了人机对话、人机协作的优势，可作为人机协同英语教学的典型案例。下面结合相关教学案例，围绕教学设计、学习过程指导和评价等关键环节，构建人机协同英语教学的基本路径。

### 2.2.1. 人机协同的英语教学设计和准备

按照英语教学设计的一般原理，依据教材内容、学习目标和学情等设计核心学习任务，是教师设计教学的基础性工作。在 Unit 7 *Between Real and Virtual* 备课时，教师无需检索书本文献，也不用无头绪地进行大量资料查阅，仅通过询问大语言模型就可以获得模块主题相关信息，包括背景材料、最新的词汇和范文等充实的教学资料。这些来自多渠道的素材往往会给教师更充足的创意，得以创新教学内容。

以《新目标大学英语·综合教程》unit 7 *Between Real and Virtual* 为例，我们可以通过 ChatGPT3.5 查找相关教学资料，方便教师制作教学设计。以下是 GPT-3.5 生成的资料。

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**指令：** we are learning a unit called “Smart Technology, Smart Life”, and briefly explain what is smart technology, and introduce the key terms that may help me.

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**ChatGPT3.5 解析：** “Smart technology” refers to the integration of advanced technology, such as artificial intelligence, Internet of Things (IoT), and data analytics, to create innovative solutions that enhance efficiency, convenience, and connectivity in various aspects of life. Smart technology uses sensors, connectivity, and intelligent algorithms to automate processes, collect data, and make decisions without the need for human intervention.

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续表

Key terms related to smart technology that may help you understand it better include:

- 1) **Internet of Things (IoT):** IoT refers to a network of interconnected devices and objects that can collect, exchange, and share data. IoT enables the communication between devices to automate processes and create a more connected and efficient environment.
- 2) **Artificial Intelligence (AI):** AI is the simulation of human intelligence processes by machines, such as learning, reasoning, and problem-solving. AI technologies power smart systems to analyze data, make predictions, and adapt to changing conditions.
- 3) **Data Analytics:** Data analytics involves the process of examining large datasets to uncover hidden patterns, correlations, and insights. By analyzing data collected from various sources, smart technology can make informed decisions and optimize performance.
- 4) **Automation:** Automation involves the use of technology to control and perform tasks without human intervention. Smart technology often leverages automation to streamline processes, reduce manual work, and improve efficiency.
- 5) **Smart Home:** Smart home technology refers to the integration of devices and systems within a home environment to automate and control functions such as lighting, heating, security, and entertainment. Smart home technology enhances convenience, security, and energy efficiency.
- 6) **Wearable Technology:** Wearable technology includes devices that can be worn on the body, such as smartwatches or fitness trackers. These devices use sensors and connectivity to track health metrics, provide notifications, and enhance personal wellness.

Understanding these key terms will help you grasp the concepts and applications of smart technology, and how it contributes to making our lives more connected, efficient, and personalized.

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在收集到足够的教学素材后，教师也可以要求语言模型根据学生学情辅助制定综合英语课程 unit7 的教学计划，以此来梳理自己的教学思路，细化教学进度安排。语言模型可以帮助教师制定每节课的教学任务和教学目标、确定教学的重点和难点以及教学环节的安排。

ChatGPT3.5 可以帮助教师准备课程教案。以下为例子。

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Title: Exploring Smart Cities - A 45-Minute Lesson Plan

Objective:

By the end of the lesson, students will be able to understand the concept of smart cities, their key features, benefits, and potential challenges.

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Materials Needed:

- Video clips or images showcasing smart city technologies
- Whiteboard and markers
- Handouts with discussion questions and key points
- Laptop or device for presenting media
- Internet access for research activities

Lesson Outline:

I. Introduction (5 minutes)

- Greet the students and introduce the topic of smart cities.
- Define what a smart city is and its main objectives.

II. Video Presentation (10 minutes)

- Show video clips or images of smart city technologies in action.
- Discuss how these technologies impact various aspects of urban life.

III. Key Features of Smart Cities (10 minutes)

- Explain the key features of smart cities such as IoT devices, connectivity, data collection, and sustainability.
- Engage students in a brainstorming session to list examples of smart city technologies they are familiar with.

IV. Benefits of Smart Cities (10 minutes)

- Discuss the potential benefits of smart cities, including improved efficiency, sustainability, mobility, and quality of life.
- Encourage students to think about how smart city technologies can address urban challenges.

V. Challenges and Considerations (5 minutes)

- Present some of the challenges and considerations associated with implementing smart city initiatives, such as privacy concerns, data security, and digital divide.
- Facilitate a brief discussion on how these challenges can be addressed.

VI. Class Activity (5 minutes)

- Divide the students into small groups and assign each group a specific aspect of smart cities to research further.
- Ask them to discuss the potential impact of their assigned aspect on urban living.

VII. Conclusion (5 minutes)

- Reconvene as a class and have each group share their findings.
- Summarize the main points discussed during the lesson and address any final questions.

Extension Activities (if time allows):

1. Debate: Divide the class into two groups to debate the pros and cons of smart city technologies.
2. Design Your Smart City: Ask students to create a concept map or drawing of their ideal smart city with labeled key features.

Assessment:

Students can be assessed based on their participation in class discussions, group activities, and their understanding of smart city concepts demonstrated throughout the lesson.

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续表

Note: This lesson plan is designed for a 45-minute class period. Adjustments can be made to accommodate longer class times or further exploration of specific smart city topics.

同时大语言模型可以帮助教师编写练习题。学生掌握短语不同义项的程度往往存在差异。即使这个短语十分常见，学生也可能只是熟悉其中的一部分用法，而对低频或者引申的意义相对陌生。以这个单元为例，课后有一个短语“break down”既有故障，损坏的基本意思，也有使物质分解、讨论，关系失败，健康衰竭等引申义。为帮助学生准确理解熟词生义，教师可以使用大语言模型生成语义辨析练习，锻炼学生根据语境识别目标短语不同意义的能力。

指令: please design multiple choice questions to distinguish all the meanings of the phrase “break down”. please provide the answers along with explanations.

1) The old car \_\_\_\_\_ on the highway, leaving the driver stranded. a) broke down b) broke off c) broke away d) broke in

Answer: a) broke down Explanation: The phrase “break down” is commonly used to describe when a machine or vehicle stops working or malfunctions.

2) Sarah couldn't control her emotions and started to \_\_\_\_\_ in tears during the presentation. a) break down b) break off c) break away d) break in

Answer: a) break down Explanation: “Break down” can also mean to lose control emotionally and start to cry or become upset.

3) The negotiators couldn't reach an agreement and decided to \_\_\_\_\_ discussions for the day. a) break down b) break off c) break away d) break in

Answer: b) break off Explanation: “Break off” means to end abruptly or interrupt something such as a conversation or negotiations.

4) The runners prepared to \_\_\_\_\_ as soon as the race started. a) break down b) break off c) break away d) break in

Answer: c) break away Explanation: “Break away” means to separate or move quickly away from a group to establish a lead or gain a distance in a race or competition.

大语言模型还可以帮助教师和学生课文中长难句进行结构分析并解释。

在英语学习过程中，当词汇积累达到一定规模，并掌握了基本句法规则，学习者便进入高级阶段。为加强学生对正式、非正式英语的语句风格差异，我们可以使用大语言模型就同一主题生成两个语篇，用以对照。

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指令: Please analyze the given sentence and explain the syntactic relationships between its different parts. “Many critics are already questioning the practicality of Masdar, claiming that by the time the city is built, many of the technologies on which its foundations are based will become outdated.”

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In the given sentence: “Many critics are already questioning the practicality of Masdar, claiming that by the time the city is built, many of the technologies on which its foundations are based will become outdated.”

1) Subject and Verb Relationship:

- The subject of the sentence is “Many critics” (noun phrase).
- The main verb is “are questioning” (present continuous tense) which is describing the action that the critics are currently performing.

2) Main Clause and Dependent Clause:

- The sentence contains two clauses: a main clause and a dependent clause.
- The main clause: “Many critics are already questioning the practicality of Masdar.”
- The dependent clause: “claiming that by the time the city is built, many of the technologies on which its foundations are based will become outdated.”
- The dependent clause provides additional information about the reasons behind the critics’ questioning.

3) Complement Relationships:

- “The practicality of Masdar” is the object of the verb “questioning.”
- “That by the time the city is built” introduces the dependent clause.
- “Many of the technologies” is the subject of the verb “will become outdated.”
- “On which its foundations are based” is a relative clause modifying “technologies.”

4) Prepositional Phrases:

- “Of Masdar” and “on which its foundations are based” are prepositional phrases providing additional information about Masdar and the technologies.

Overall, the sentence presents the idea that many critics are currently questioning the feasibility of the city of Masdar due to concerns about the potential obsolescence of the technologies it is built upon by the time the city is completed.

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指令: Could you write two 120 words essays on the topic “The pros and cons of smart city” One should be in a formal style, and the other in an informal style.

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Formal Essay: Smart cities have become a focal point in urban development discussions, with both significant advantages and drawbacks. On the positive side, smart cities leverage advanced technologies to enhance efficiency and sustainability. Features such as smart energy grids, intelligent transportation systems, and data-driven governance can lead to improved resource management and urban planning. Moreover, the integration of information and communication technologies (ICT) can enhance citizen engagement and foster a more connected community. However, smart cities also face challenges, such as cybersecurity risks, data privacy concerns, and potential social inequalities arising from unequal access to technology. Striking a balance between technological advancement and social equity is crucial to ensure that smart cities benefit all segments of the population.

Informal Essay: So, you know about smart cities, right? They're like super futuristic urban areas that use cool tech to make things run smoothly. The good stuff includes better resource management, efficient transport systems, and data-driven decision-making. Imagine living in a place where everything is smart and connected! But hey, it's not all rainbows and unicorns. Smart cities also have their downsides, like privacy worries and the potential for tech to worsen social inequalities. We gotta be careful and make sure everyone gets to enjoy the smart city benefits. It's like finding the right balance between all the high-tech stuff and making sure it helps everybody. Cool, right?

以上辅助工作大大节约了教师备课的时间和精力，提高教师教学效率，同时根据学生学情进行的有针对性地多层次教学设计又可以适应分层教学等多种教学要求，体现了教学环节设计的精准性和严密性。

### 2.2.2. 学情跟踪和教学评价

大语言模型在英语教学中的学情跟踪和教学评价可以发挥重要作用。在学情反馈方面，在传统的课堂中，教师由于课堂规模和学生人数的限制，很难对每位同学进行课堂点评和作业上的细致批改，大语言模型还可以根据学生的学习进度和能力水平，提供个性化的学习方案和建议。这有助于教师了解每位学生的学习需求。学生在进行练习时，模型能够及时提供反馈，帮助学生快速纠正错误，提升学习效果。大语言模型还可以通过分析学生的学习记录和测试结果，识别出学生的薄弱环节，帮助教师制定相应的辅导计划。大模型能与学生进行对话练习，模拟真实场景，提高学生的口语能力，同时记录其表现以供评估。

在教学评价方面大语言模型能够自动评分，包括作文、口语等，并提供具体的评语和改进建议，减轻教师的工作负担。通过分析多种学习数据(如测试成绩、互动记录等)，大语言模型可以为学生提供更全面的评价，帮助教师做出更精准判断。除了结果评价，模型还可以关注学生的学习过程，通过观察学生的学习习惯和参与度，对其进行动态评价。模型可以生成定期的学习报告，帮助教师和学生清晰了解学习进展和成就，促进更有效的学习和教学。

大语言模型在英语教学中的应用，可以有效提升学情跟踪的准确性和教学评价的多样性，帮助教师更好地理解学生的需求，进而优化教学策略，提高英语教学的整体效果。

### 2.2.3. 大语言模型在外语教学中存在的缺点

大语言模型在外语教学中虽然有很多潜在的优点，但也存在一些缺点和挑战。1) 部分教师和学生可能会过度依赖大语言模型，而降低使用传统教学方法的意愿和能力。这可能导致教育者在培养学生的自主学习能力和批判性思维方面面临挑战。2) 尽管大语言模型能够提供个性化的学习体验，但对于某些学生来说，模型可能难以完全满足其学习需求。学习者的学习风格和节奏各不相同，这可能导致部分学生在使用大语言模型时感到困惑或无法充分发挥其学习潜力。3) 大语言模型通常需要访问大量的个人数据和学习内容以实现个性化学习体验，这可能存在数据隐私泄露的风险。教育者和学生需要注意保护个人数据安全和隐私。4) 大语言模型可能存在语言和文化方面的局限性，特别是对于一些少数语言或特定方言的支持可能不足。这可能对学生学习这些语言和文化造成一定程度的阻碍。5) 模型可能生成语法正确但语义不符合实际情况的句子，容易误导学生。在某些情况下，模型对上下文的理解可能有限，导致在特定情境下的使用不当。

## 3. 结语

尽管大语言模型在外语教学中具有许多优势，但我们也需要认识到其存在的一些缺点，并通过综合运用多种教学方法和技术来克服这些挑战，以实现更全面和有效的外语教学。教师们也要认识到大模型已经是“屋中大象”[6]，我们无法忽视，只有合理应用，正确引导学生，为我所用才是正途。

## Conflicts of Interest

The author declares no conflicts of interest.

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## Appendix (Abstract and Keywords in Chinese)

### 基于人机协同的大学英语教学应用： 以《新目标大学英语系列·综合教程 2》教学为例

**摘要：**现代工业化背景下，人机协同在制造业，医疗保健，农业等领域得到了广泛的应用。在教育领域，人机协同已经开始改变传统的教与学的方式。本文旨在讨论如何将大语言模型运用到大学英语教学中。主要探索大语言模型在教师教学和课程建设等方面的应用路径和方法及不足之处。并指出了人工智能背景下大学英语教学未来的研究和发展方向。

**关键词：**人机协同模式，大语言模型，ChatGPT3.5