

曹鹭 CAO LU

陈瑞球楼 231 室, 上海交通大学, 上海
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教育经历

悉尼大学

博士, 学习科学 2020. 12
• 研究兴趣: 学习科学, 游戏化学习, STEAM 教育

硕士, 学习科学与技术 2015. 11

华东师范大学

学士, 生物科学 2014. 6

科研经历

上海交通大学 上海, 中国
助理教授 2023. 9 - 至今

华东师范大学

高峰博士后 上海, 中国
2021. 1 - 2023. 6

同行评审期刊

- Cao, L., & Zhang, J.* (2024). Exploring the use of productive failure to learn ecology in a virtual world: influence of self-efficacy and the use of learning strategies. *Interactive Learning Environments*, 1-19. (SSCI)
- Cao, L.*, Lai, P. K., & Yang, H. (2024). Using productive failure to learn genetics in a game-based environment. *Instructional Science*, 52, 309-340. (SSCI)
- Yang, H., Tsung, L., & Cao, L.* (2022). The Use of Communication Strategies by Second Language Learners of Chinese in a Virtual Reality Learning Environment. *SAGE Open*, 12(4). (SSCI)
- 曹鹭. (2022). 三种基本学习理论与教育游戏的变革[J]. 开放教育研究, 28(05): 29-38+92. (CSSCI)
- 曹鹭. (2021). 有效失败与知识迁移: 理论、机制与原则[J]. 开放教育研究, 27(03): 4-14. (CSSCI)
- 迈克尔·J·雅各布森, 摩奴·卡普木, 彼得·赖曼, 张婧婧, 王雨晨, 曹鹭. (2018). 学习与教育研究中的理论之争——建立学习的复杂系统概念化框架. 开放学习研究, 23(02), 1-8.
- 曹鹭, Michael, J. Jacobson, 徐光涛. (2017). 利用虚拟世界及基于代理的模型学习科学探究——计算机化科学探究模型浅析[J]. 中国电化教育, (7): 33-41. (CSSCI)

国际会议论文

- Cao, L., Yang, H., & Ma, S. (2025). *Exploring students' emotions in an extended reality (XR) with generative AI learning environment*. In Proceedings of the 19th International

Conference of the Learning Sciences (ICLS 2025).

- Cao, L., Jacobson, M. J., & Markauskaite, L., Lai, P. K. (2020). The use of productive failure to learn genetics in a game-based environment. *2020 Annual Meeting of the American Educational Research Association, AERA.*
- Cao, L., Jacobson, M. J., & Markauskaite, L. (2017). The use of PBL virtual world to learn nutrition knowledge. *2017 Annual Meeting of the American Educational Research Association, San Antonio, TX: AERA.*

主持或参与课题情况

- 2025 年度上海交通大学文科培育项目《数智时代下的大学生变革能动性培养研究》（主持）
- 2023 年度上海市教育科学研究青年项目《元宇宙视域下的青少年创新思维培养研究》（主持）
- 2022. 中国博士后科学基金第 71 批面上资助,《使用有效失败理论培养中学生创新思维研究》（主持, 已结题）
- 2025. 上海科技馆采购项目《科普游戏评估体系研究》（参与）
- 2021-2022. 悉尼大学 SSESW 特定研究计划资助《中文教育虚拟体验式语言学习环境》（主要参与）
- 2017-2020. 悉尼大学 SSESW 特定研究计划资助《用基于代理的虚拟学习环境学习科学理解》（参与）

教学经历

- 2025 上海交通大学教育学院《AI+微专业: AI 赋能学科教学(生物)》 主讲
- 2024-2025 上海交通大学教育学院教育硕士研究生秋季学期必修课程《中学生物课程与教材研究》、《中学生物教学设计与实施研究》 主讲
- 2022. 华东师范大学开放教育学院在线课程《用游戏帮助 STEM 教育》 主讲
- 2021-2022. 华东师范大学教育心理系课程《教育心理学研究方法》 客座讲师
- 2021-2022. 华东师范大学教师教育学院暑期研究生课程《生物学教育专题研究与写作》 课纲编写兼客座讲师

社会工作

- 2025-至今 中国教育技术协会教育游戏专业委员会 理事
- 2024-至今 上海市交通大学教育学院 2025、2026 级国优计划二次遴选班主任
- 2024. 协助筹办第三届上海卓越教育国际研讨会 (SFEE 2024)
- 2024. 上海交通大学本科生招生工作
- 2022. 参与上海市新版小学科学教材竞标工作 (竞标成功)

期刊审核经历

- *International Journal of Applied Linguistic*、*Sage Open*、*Instructional Science*、*Journal of Computer Assisted Learning*、*Journal of The Learning Sciences* 审稿人

软件开发

马良 2024

- 帮助小学生开展创意绘画的网页生成式人工智能 APP。Dify 和 Python 开发。

巫师与妖精 2018

- 帮助高中生学习遗传学和相关数学知识的 3D 电脑游戏。Unity 和 C#开发。

素问 2015

- 帮助初中生学习营养学知识与科学设计的 3D 虚拟世界。Unity 和 C#开发。

INGRID LU CAO

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EDUCATION

The University of Sydney

Ph. D., Learning Sciences

December 2020

M. A., Learning Sciences and Technology (Research)

November 2015

East China Normal University

B. S., Biology

June 2014

RESEARCH EXPERIENCE

Shanghai Jiao Tong University

Assistant Professor

Shanghai, China

September 2023 – Present

East China Normal University

Postdoctoral Fellow

Shanghai, China

January 2021– June 2023

REFEREED PAPERS IN JOURNALS

- Cao, L., & Zhang, J.* (2024). Exploring the use of productive failure to learn ecology in a virtual world: influence of self-efficacy and the use of learning strategies. *Interactive Learning Environments*, 1-19.
- Cao, L.*, Lai, P. K., & Yang, H. (2024). Using productive failure to learn genetics in a game-based environment. *Instructional Science*, 52, 309–340.
- Yang, H., Tsung, L., & Cao, L.* (2022). The use of communication strategies by second language learners of Chinese in a virtual reality learning environment. *SAGE Open*, 12(4).
- Cao, L. (2022). Three fundamental learning theories and educational game design (In Chinese). *Open Education Research*, 28(05), 29-38+92.
- Cao, L. (2021). Productive failure and the transfer of knowledge: theories, mechanisms and design principles (In Chinese). *Open Education Research*, 27(3), 4-14.
- Cao, L., Jacobson, M. J., Xu, G. (2017). An introduction of Computational Scientific Inquiry: Learn Scientific Inquiry in a 3D Immersive Virtual World with Agent-Based Models (In Chinese). *China Educational Technology*, (7), 33-41.

PAPERS PRESENTED AT INTERNATIONAL CONFERENCES

- Cao, L., Yang, H., & Ma, S. (2025). *Exploring students' emotions in an extended reality (XR) with generative AI learning environment*. In Proceedings of the 19th International Conference of the Learning Sciences (ICLS 2025).
- Cao, L., Jacobson, M. J., & Markauskaite, L., Lai, P. K. (2020). The use of productive failure to learn genetics in a game-based environment. *2020 Annual Meeting of the American Educational Research Association*, Virtual meeting: AERA.

- Cao, L., Jacobson, M. J., & Markauskaite, L. (2017). The use of PBL virtual world to learn nutrition knowledge. *2017 Annual Meeting of the American Educational Research Association*, San Antonio, TX: AERA

PRESENTATION TALK

- Cao, L. (2024). Using game-based learning and productive failure to support secondary school biology teaching. Keynote Presentation at *the 19th National Academic Conference on Biology Curriculum and Pedagogy in Higher Normal Universities*, Chaozhou, China.
- Cao, L. (2024). Teachers' epistemic agency by double stimulation: A cultural-historical perspective. Oral Presentation at the *2024 Annual Conference of the Learning Sciences Research Division*, China Association of Higher Education, Shanghai, China.

GRANTS

- Lead CI in 2025 Shanghai Jiao Tong University Humanities Young Talent Development Program: *Developing University Students' Transformative Agency in the Digital and Intelligence Era* (2025QN041, AU\$10000)
- Lead CI in 2023 Shanghai Education Sciences Research Early Career Program: *Developing Adolescents' Creative Thinking in Metaverse* (B2023001, AU\$12000)
- Lead CI in 2022 The 71st Surface Funding of China Postdoctoral Science Foundation: *Developing Creative Thinking for Middle School Students Using Productive Failure* (2022M711163, AU\$10000)

AWARDS

- 2023 Encouragement Award in the Third Teaching Competition for Early Career Teachers, School of Education, Shanghai Jiao Tong University
- 2019 Postgraduate Research Support Scheme, The University of Sydney
- 2018 FASS Doctoral Research Travel Grant Scheme, The University of Sydney
- 2017 Thomas T. Roberts Fellowship, The University of Sydney

JOURNAL ARTICLE REVIEW EXPERIENCE

- Invited to review journal articles for *International Journal of Applied Linguistics*, *Sage Open*, *Instructional Science*, *Journal of Computer Assisted Learning*, *Journal of The Learning Sciences*

SOCIAL SERVICES

- 2025- Present. Board Member, Educational Games Professional Committee, China Association for Educational Technology (CAET)
- 2024 – Present Class advisor for the National Excellence Program (Second Selection), Class of 2025/2026, School of Education, Shanghai Jiao Tong University
- 2024 Assisted in organizing the Third Shanghai Forum for Education Excellence (SFEE 2024)
- 2024 Undergraduate admissions officer, Shanghai Jiao Tong University
- 2022 Participated in the bidding process for the development of the new edition of elementary school science textbooks in Shanghai (successfully won the bid)

TEACHING EXPERIENCE

- 2025 lecturer for *AI-Enabled Disciplinary Teaching (Biology): AI Plus Micro-Credential Program*, School of Education, Shanghai Jiao Tong University
- 2025 lecturer for *Research on Secondary School Biology Instructional Design and Implementation*, Faculty of Education, Shanghai Jiao Tong University
- 2024 lecturer for *Research on Secondary School Biology Curriculum and Textbook* Faculty of Education, Shanghai Jiao Tong University
- 2021 lecturer for *The Use of Educational Games to Support STEM Education*, Faculty of Education, East China Normal University
- 2021-2022 Visiting lecturer for *Research Methodologies in Educational Psychology* graduate course, Department of Educational Psychology, East China Normal University
- 2021-2022 Course outline developer and visiting lecturer for *Research of Biology Education and Academic Writing* graduate course, College of Teacher Education, East China Normal University

SOFTWARE DEVELOPMENTS

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| <i>Maliang</i> | 2024 |
| <ul style="list-style-type: none">• An LLM-based generative AI website app that allows children to interact with it to generate various images to assist in their creative painting process. The app was developed using Dify and Python. | |
| <i>Wizards and Fairies</i> | 2018 |
| <ul style="list-style-type: none">• A 3D video game for helping high school students to learn genetics and related mathematical knowledge. The video game was developed using Unity and C#. | |
| <i>Suwen</i> | 2014-2015 |
| <ul style="list-style-type: none">• A 3D virtual world aims for helping secondary school students to learn how to design healthy meal plans. The 3D virtual world was developed using Unity and C#. | |