

Language Learning Design in K-12 AR Classroom

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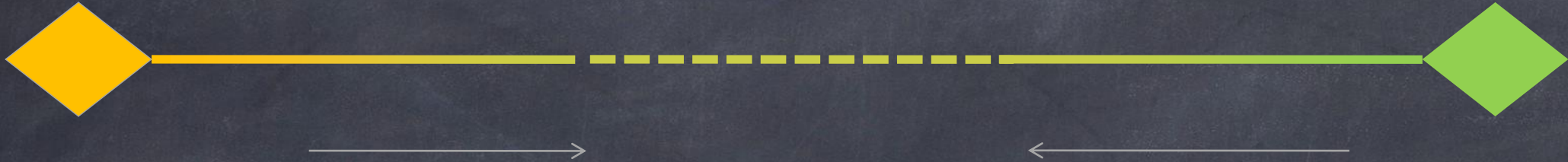
Research Institute of Science Education

Advanced Innovation Center for Future Education

Beijing Normal University



Milgram's Reality-Virtuality Continuum



Real Environment



Augmented Reality
(AR)



Augmented Virtual
(AV)



Virtual Reality
(VR)

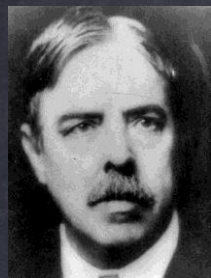
Milgram, P., Kishino, F. A, (1994) "Taxonomy of Mixed Reality Visual Displays." *IECE Trans. on Information and Systems* (Special Issue on Networked Reality), vol. E77-D, no. 12, pp.1321-1329 .

VR/AR new teaching environment

VR/AR可以用来模拟学习对象，让学习者在现实环境中看到并且操作生成的虚拟模型和场景，以最贴近自然的交互形式提供了一个自主探索的空间

VR/AR can be used to simulate learning objects, allowing learners to see and operate the generated virtual models and scenes in the real environment, providing a space for autonomous exploration in the most natural interactive form

VR/AR teaching conforms to educational theory



行为主义 Behaviorism

学习是**刺激-反应(S-R)**联结公式,
由刺激得到反应而完成学习



具身认知理论 Embodied cognitive theory

只有当学习者的**认知、身体与环境**三者
进行有效互动时才能进行学习



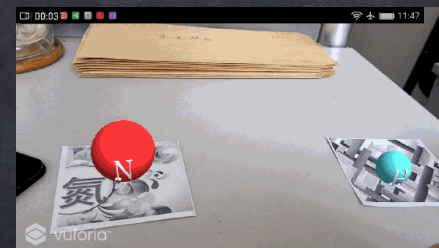
建构主义 Constructivism

“把实验室搬到课堂中去”

children are encourage to discover themselves through spontaneous interaction with the environment

“学习是一种真实情境的体验”

humans construct knowledge and meaning from their experiences



MOW: Augmented Reality Game to Learn Words in Different Languages



飞虫



Fliege



Mouche



Figure 5. Game 1 being played with Portuguese (left image) and English (right image) words.



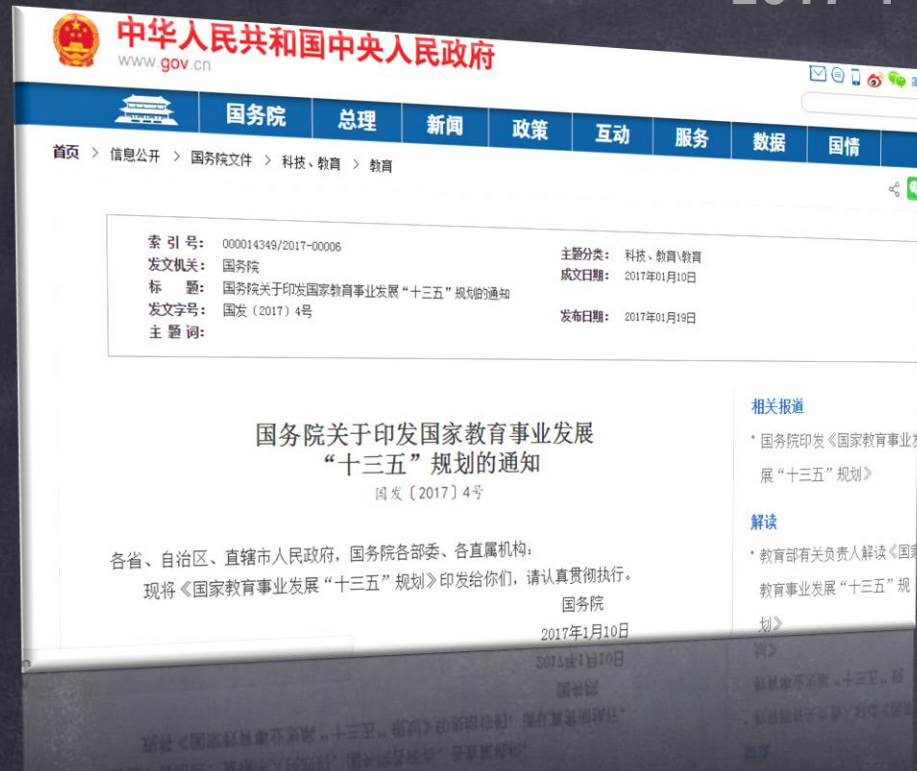
Figure 6. Game 2 being played. An incorrect match is performed on the left image and a correct match on the right image.

Trends in Educational Technology 2009 - 2020

Time – to-Adoption	Horizon Report 2009	Horizon Report 2010	Horizon Report 2011	Horizon Report 2012(K12)	Horizon Report 2016(HE)	Horizon Report 2016(K-12)	Horizon Report 2017(K-12)	Horizon Report 2018(HE)	Horizon Report 2019(HE)	Horizon Report 2020(TL)
1 year or less	Mobiles	Mobile Computing	Electronic Books	Mobile Devices& Apps	BYOD	Makerspaces	Makerspaces	Analytics Technologies	Mobile Learning	Adaptive Learning
	Cloud Computing	Open Content	Mobiles	Tablet Computing	Learning Analytics and Adaptive Learning	Online Learning	Robotics	Makerspaces	Analytics Technologies	AI/Machine Learning
2-3 years	Geo-Everything	Electronic Books	Augmented Reality	Game-Based Learning	Augmented and Virtual Reality	Robotics	Analytics Technologies	Adaptive Learning Technologies	Mixed Reality	Analytics for Student Success
	The Personal Web	Simple Augmented Reality	Game-Based Learning	Personal Learning Environments	Makerspaces	Virtual Reality (include AR)	Virtual Reality (include AR)	Artificial Intelligence	Artificial Intelligence	Elevation of Instructional Design, Learning Engineering, and UX Design
4-5 years	Semantic-Aware Applications	Gesture-Based Computing	Gesture-Based Computing	Augmented Reality	Affective Computing	Artificial Intelligence	Artificial Intelligence	Mixed Reality	Blockchain	Open Educational Resources
	Smart Objects	Visual Data Analysis	Learning Analytics	Natural User Interfaces	Robotics	Wearable Technology	The Internet of Things	Robotics	Virtual Assistants	XR(AR, VR, MR, Haptic) Technologies

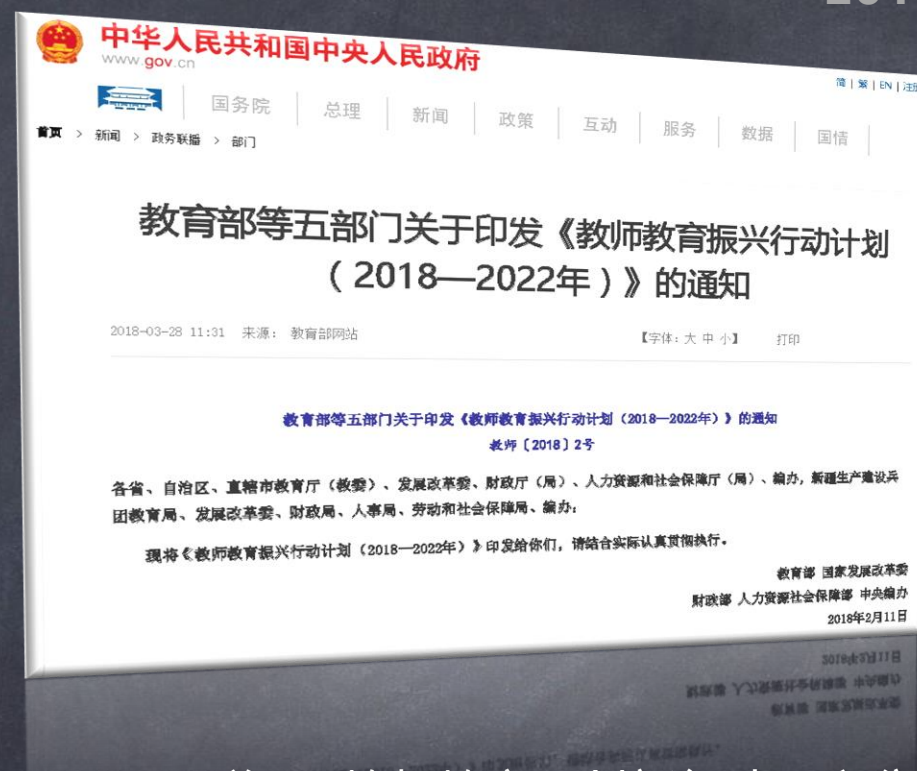
国家教育事业发展“十三五”规划

2017-1-10



教师教育振兴行动计划(2018-2022)

2018-2-11



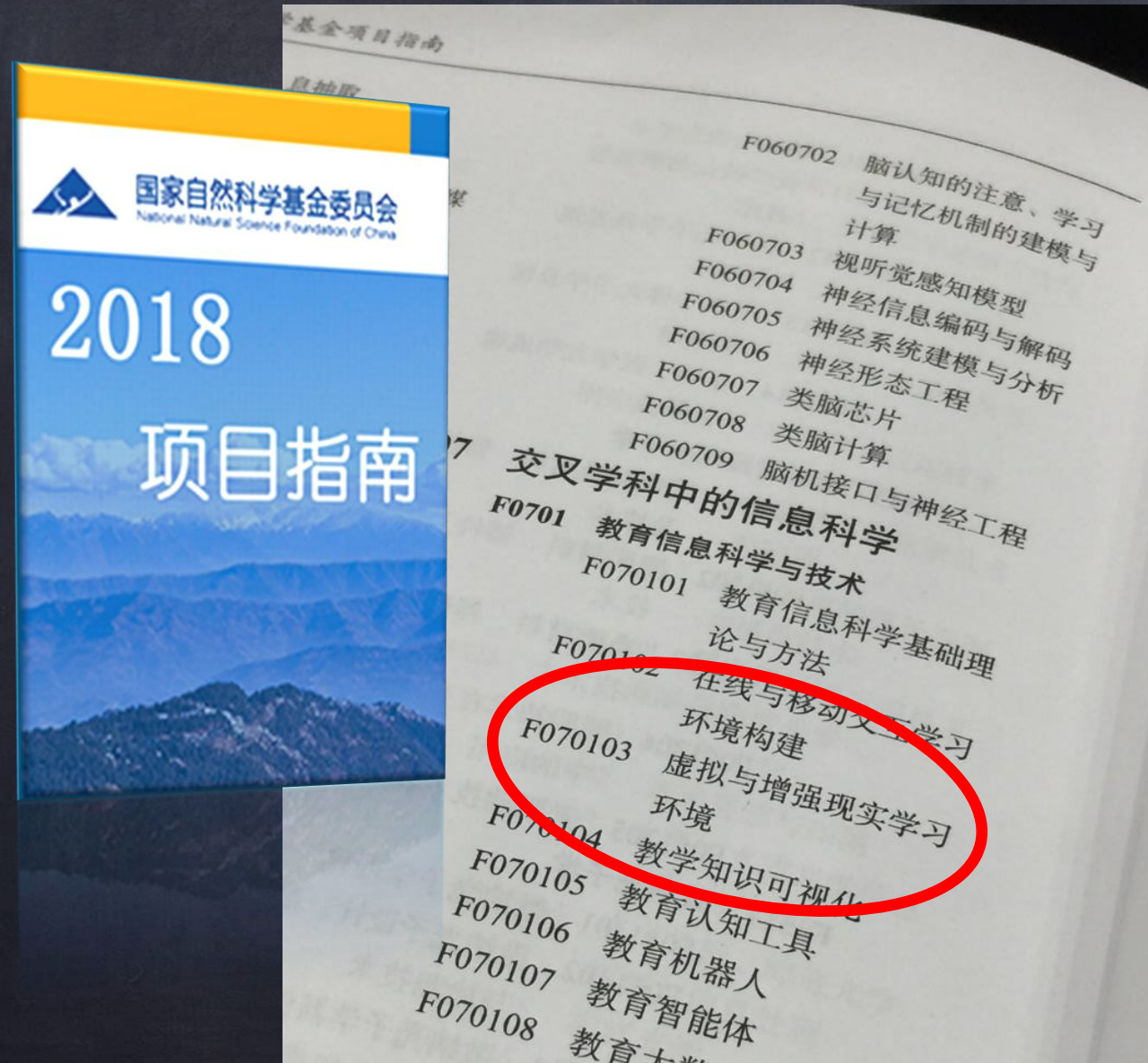
“要全力推动信息技术与教育教学深度融合……综合利用互联网、大数据、人工智能和**虚拟现实**技术探索未来教育教学新模式”

"We must fully promote the deep integration of information technology and education and teaching.... Comprehensive use of the Internet, big data, artificial intelligence and **virtual reality** technology to explore a new model of future education and teaching"

(五) “互联网+教师教育”创新行动。充分利用云计算、大数据、**虚拟现实**、人工智能等新技术，推进教师教育信息化教学服务平台建设和应用，推动以自主、合作、探究为主要特征的教学方式变革

(5) Innovative actions of “Internet + Teacher Education”. Make full use of new technologies such as cloud computing, big data, **virtual reality**, artificial intelligence, etc., promote the construction and application of teacher education informatization teaching service platform, and promote the transformation of teaching methods characterized by autonomy, cooperation and inquiry.

国家自然科学基金增设教育信息科学与技术



“围绕教育信息科学中的知识生产、认知规律、学习发展等方面的核心科学问题与关键技术，进行原创性、基础性、前瞻性和交叉性研究；鼓励在人工智能驱动教育的基础理论与方法...**虚拟与增强现实学习**...等方向的理论与方法研究”



VR/AR+ Edu Lab in BNU

<http://ar.bnu.edu.cn/>

“VR/AR+教育”实验室依托北京师范大学教育学部、科学教育研究院、未来教育高精尖创新中心，致力于K-12阶段AR+教育、人机自然交互、STEM教育等软件平台、资源内容研发。团队协同特级教师进行案例开发，群策群力探讨符合教育规律的产品，并深入中国大陆以及香港、马来西亚等一线学校进行实证案例教学，不断循环迭代，探究虚实融合的AR学习环境如何支持新时代的教与学

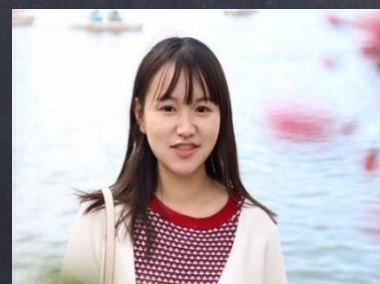
“VR/AR+ Education” Lab in Beijing Normal University is aimed to research on K-12 AR application in education, human-computer natural interaction, STEM education. The team also went to the primary and secondary schools in mainland China, Hong Kong, Malaysia etc. to conduct empirical case teaching, and continuously cycled iterations to explore how the AR learning environment can support teaching and learning



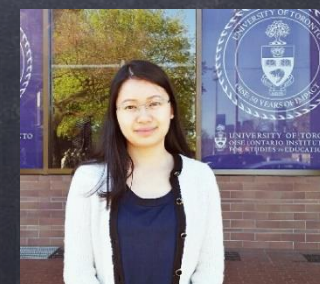
Cai Su, Director of VR/AR+ Edu Lab



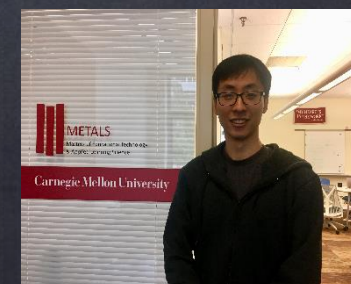
Wang Xu
-Harvard University



Chen Miao
- UCL



Zhu Gaoxia
-University of Toronto



Li Hao
-CMU

Outstanding students in lab



“AR+Education” K-12 Experimental Schools



天津南开外国语中学



北京五十中分校



北京师范大学朝阳附属小学



清华附小



安徽阜南一小



南京外国语学校仙林分校



山西太谷县水秀乡中学



深圳市梅山中学



北京朝阳区安华学校



湖北洪湖贺龙中学



首都师范大学附属中学



北京育英学校



北京海淀区东方娃娃幼儿园



北京海淀区培智中心学校



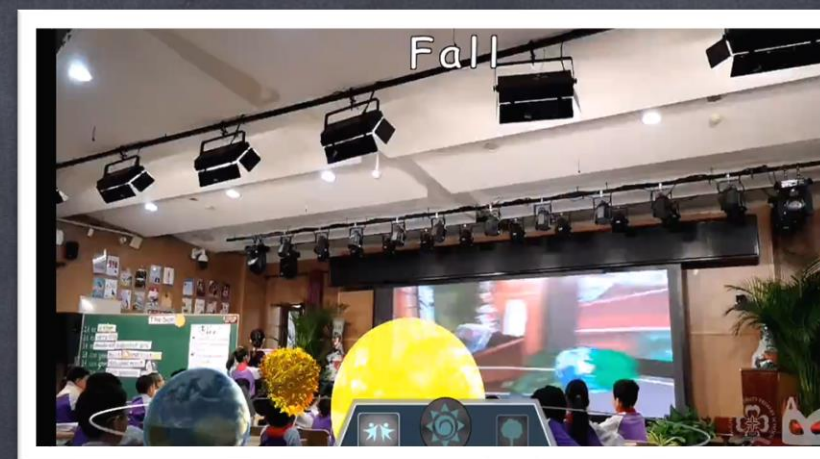
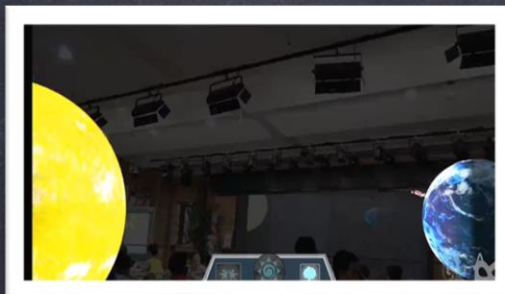
山东莱芜市花园学校



AR English Lessons in Primary School

—Solar System, Sun & Earth, Our Earth

Regular classroom



Open Class by Guo Shanshan

实验学校：清华附小 Tsinghua University Primary School

<https://mp.weixin.qq.com/s/uyBen3hvTrTmAtEipmSJ3Q>

渐进式推进课堂教学变革

轻量的技术/设备

不要笨重的专用设备

优秀的教学设计

不要炫技式教学

技术赋能教育

不是取代教师

扫一扫“教育新技术”微信公众号
获取更多新技术教育应用

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Education
Research Institute of Science Education
Advanced Innovation Center for Future
Education
Beijing Normal University

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