The Effect of Educational Games on Students' Learning Achievement：a Meta-Analysis

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◆ Computer-assisted learning having been proven to to a effective tool;

◆ In recent years,educational games(EG) are the hot subject；

◆ However, experimenta results reported are different completely.

- Some experimental research prove that EG has a positive effect on students' learning achievement （*Marina,2009;Smith et al.,2013;Chang et al.,2015*）;

- But, Some experimental research get opposite results*(Sarah,2006;Ferguson.2014)*;

- Also, some experimental research prove that EG has no effect on students' learning achievement(Guttorm et al.,2009;Sadiq,2010;Bakker et al.,2016).

- Does EG impact students' learning achievement at school,compared to students' learning achievement without EG? If so,to what extent?

- What study features moderate the effects of EG on students' learning achievement?

- What are the optimal conditions for effective learning with EG in term of students' learning achievement?

Part 3: Research Methodology

- Reseach Method

   Meta-analysis method

   Set SMD(standardized mean difference) as effect value

- Literature Search

   Select ERIC,Science Direct,ProQuest as data source

   571 articles and 61dissertations

- Exclusion Criteria

  a.test the effect of EG on sudents' learning;

  b.use experimental or quasi-experimental design;

  c.participants only include students;

  d.report enough information to calculate SMD.

- Retain 48 effective samples finally,including 43 papers, 5 dissertation.

- Coding study

  Grade is coded as "Primary","Middle","College"

  Discipline is coded as"Math","Computer","Science;","English"," Biology",

" Geography","His&Soc","Phy&Chem","Other".

- Data Analys

  Comprehensive Meta-analysis Software 2.0

EG has a positive effect on students' learning achievement, and the effect size is 0.560.

Model	Point Estimate	95% Confidence Interval		Heterogeneity
		Lower limit	Upper limit	
Fixed	0.579***	0.554	0.639	712.373***
Random	0.560***	0.402	0.718	

The effect of EG on students' learning achievement has not significant differences in different student grade.

Grade	Point Estimate	95% Confidence Interval		Heterogeneity （Q_{BET}）
		Lower limit	**Upper limit**	
Primary	0.512***	0.396	0.628	Q_{BET}=3.400 (p=0.184)
Middle	0.618***	0.570	0.666	
College	0.542***	0.403	0.680	

Discipline	Point Estimate	95% Confidence Interval		Heterogeneity (Q_{BET})
		Lower limit	Upper limit	
Math	0.135**	0.035	0.236	Q_{BET}=163.143 (p<0.001)
English	0.645***	0.497	0.893	
Computer	0.695***	0.497	0.893	
Biology	0.460***	0.354	0.566	
Science	0.793***	0.731	0.855	
Geography	0.331**	0.075	0.587	
His&Soc	0.609***	0.353	0.865	
Phy&Chem	0.463**	0.083	0.842	
Other	1.882***	1.435	2.328	

The effect of EG on students' learning achievement has significant differences in different student discipline.

The End
Thank you

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