首届教育实证研究优秀成果奖
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目 录

基础教育满意度实证研究

"全国教育满意度测评研究"课题组

摘要：对我国31个省幼儿、中小学生、家长和一线教师6万余人的调查显示，在基础教育满意度指数模型中，学生和家长的满意度受教育期望、质量感知和公平感知显著正向影响，教师满意度受期望、保障条件感知、学校管理质量感知等维度显著正向影响。教育公平感知、保障条件感知还分别通过质量感知和管理感知间接影响总体满意度水平。高效率提高基础教育满意度，应优先改进几个方面的工作：尊重儿童兴趣和特点、丰富课程类型和形式；保障幼儿教师工作条件、尊重教师发表意见的权利、提高教师待遇。为了让人民共享发展成果，我们应关注低收入人群、农村和不发达地区学校的师生、老教师、非本地户籍中学生等满意度较低的群体。建立适当的教育期望是提高满意度的前提，公平感知的提升须分配公平和程序公平并重，教育方式个性化势在必行，实现社会公平是提高人民满意度的根本措施。

关键词：基础教育；满意度指数；教育期望；公平感知；质量感知

Abstract: The survey on 60 thousand of people as preschool children, pupils, parents and teachers from 31 provinces has shown that, in the model of basic education satisfaction, educational expectation, perception of quality and equity have significant positive effects on students and teachers' educational satisfaction; teachers' educational satisfaction is impacted positively by educational expectation, working conditions and perception of school management quality. Furthermore, the perception of education equality and guarantee condition brings indirect influence on the general satisfaction degree through the perception of quality and management. To effectively promote the satisfaction degree of basic education, the priority countermeasures should be undertaken as respecting children's interests and characteristics, enriching the types and forms of courses; improving working conditions of preschool teachers, empowering teachers' rights to express their views, and improving teachers' welfare. In order to share development achievement among all of the people, we should pay close attention to the groups with low degree of satisfaction, such as students from low-income families, teachers and students in

rural and underdeveloped areas,elder teachers,secondary school students without local household registration. It is suggested that we should establish appropriate educational expectation in premise to promote the satisfaction degree,pay equal attention to the distribution justice and process fairness,carry out individualized and diversified educational methods imperatively,and realize social equity.

大四现象：一种学习方式的转型———清华大学本科教育学情调查报告 2013

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摘要：大学生的发展是一个动态的过程，每一阶段都有其独特特征。本研究基于清华大学已经进行了五年的"中国大学生学习与发展追踪研究"的实证数据，借助大学生发展理论，重点对大四学生的学习发展特征和规律进行深入研究,试图揭示受中国社会变迁及教育改革影响、有清华教育特色的"大四现象"。研究发现，清华大学的大四现象主要体现在：高年级课程教学挑战度明显不足，院校和教师对大四学生课堂学习投入的要求明显下降；但深入剖析后又发现这样一些特征:第一,大四学生对非课程性、高影响力教育活动的投入明显增加,自主探究性学习显著提高。第二,大四学生具有更大的学习自由度和自主权,也具有更强的内部动机；第三,大四学生更多采用反思性学习和整合性学习方式,自主探究性学习行为得分更高；第四,大四学生与教师的互动更加频繁,互动方式更加深入和个人化。本研究用清华案例说明：大四阶段学生的学习不再是前三年的自然延续，甚至不是传统意义上本科学习的终结阶段。大四是学生人生学习和成长的重要阶段，是学生转向社会人、劳动者或者研究者的重要过渡期。

Abstract: The development of college students is a dynamic process, with each developmental stage having its own characteristics. This study uses data from

the "Chinese College Student Survey"(CCSS), which has been conducted for five years, to analyze the learning style and developmental features of fourth-year undergraduates. It is found that two major problems exits in the fourth year's teaching and learning: courses are not challenging enough and the requirement for student engagement from teachers and department relaxes. It is also found that the learning approach of fourth-year students exhibits four feature: first, reflective and integrative learning is the main feature; secondly, fourth-year students have more freedom and autonomy in deciding what to learn with more intrinsic motivation; thirdly, the interaction between students and faculties is more frequent, personal and deeper;last, high-impact educational practices are the main activities that involve instant student engagement.

Keywords: fourth-year undergraduate phenomenon; college student development; student engagement

信息呈现方式与认知风格对概念性知识移动学习效果影响研究

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摘要：移动学习资源的设计与开发一直是教育学者关注的热点问题，但是目前的研究较少或者缺乏对学习者学习内在需求的探究。针对不同认知风格（场独立、场依存）的移动学习者，本研究探究了概念性知识的三种呈现方式（文本、图文、视频）会对移动学习效果产生怎样的影响，从而为移动学习资源设计者提供设计方向，促进移动学习者的学习。研究结果显示：在移动学习环境下学习概念性知识，图文的呈现方式最有利于移动学习者的学习；在独立进行概念性知识的移动学习时，场独立型的移动学习者学习效果比场依存型学习者学习效果更好。

关键词：概念性知识；认知风格；移动学习；信息呈现方式

Abstract: The design and development of mobile learning resources has always been top on the research agenda of educational researchers, but research into

learners' intrinsic learning needs remains a gap in the literature. This study explores how three different presentation modes (text, text and graphics, video)of conceptual knowledge influence mobile learning efficiency in relation to different cognitive styles (field dependent and field independent) of learners, aiming to provide guidelines for the designers of mobile learning resources. The result shows that the video mode can best facilitate learning conceptual knowledge in the mobile learning environment, and the field independent mobile learners can achieve better efficiency than the field dependent ones when engaged in independent mobile learning of conceptual knowledge.

Keywords: conceptual knowledge; cognitive style; mobile learning; information presentation mode

"全面二孩"政策与义务教育战略规划 — —基于未来20年义务教育学龄人口的预测

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摘要："全面二孩"政策的实施会影响未来我国义务教育学龄人口的变化。基于2010年全国第六次人口普查数据,对2016—2035年义务教育学生规模进行预测,并估算所需教师编制、教育经费和校舍建筑规模。研究表明,未来七年内我国小学学生规模不断缩小,初中学生规模由于第三次"婴儿潮"的作用有所增加; "全面二孩"政策对义务教育的影响将从2022年左右开始显现,并在短期内刺激义务教育学生规模迅速扩大,到2030年达到峰值,之后义务教育学生规模会重新开始缩小。对此波动,我国现有义务教育教师编制规模、教育经费投入力度和义务教育标准化建设速度基本可以应对,但应警惕快速城镇化带来的农村义务教育资源浪费和城镇义务教育承载能力不足等问题。建议谨慎对待农村撤点并校,同时加强教师队伍质量建设,并引导地方根据实际情况制定不同学段的教育战略规划。

关键词:全面二孩;义务教育;教育规划;人口预测

Abstract: The universal two-child policy will affect the school-aged population of Chinese compulsory education in the future. Based on the sixth nationwide

population census data, the scale and structure of school-aged population in the stage of compulsory education are predicted, and the number of teachers, funds and school buildings needed during2016-2035 are estimated. Results show that the number of primary school students in China will continue to reduce in the next 7 years, and the number of middle school students will be increased because of the third "baby boom". The impact of the universal two-child policy will emerge from around 2022，and will cause a rapid increase in the number of students in compulsory education in a short term, but the effect will be weakened from 2030. So the number of teachers in compulsory education, financial capacity and the speed of compulsory education standardized construction are enough to deal with the changes in the number of students in compulsory education. On the contrary, the problems of the waste of educational resources in rural areas, the shortage of educational resources in cities and towns caused by rapid urbanization should be concerned about. The study suggests teachers' ability should be improved, schools' closure and merger should be treated cautiously, and different governments should make education strategic plans according to local reality.

家长参与的力量——家庭资本、家园校合作与儿童成长

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摘要：为研究家庭资本、家校合作与儿童成长间的规律性联系，根据"江西省中小学幼儿园家校合作跟踪研究"的大样本数据，从家庭视角，提出了家庭经济资本、人力资本、社会资本、社区环境和家校合作对儿童成长作用的 5 个研究假设和 1 个推论，采用定序因变量回归模型和 F 联合检验的方法，发现在控制儿童智力水平，性别等变量的情况下，家庭所在的社区环境对儿童成长作用不显著，家庭经济资本中的"家庭所在地"、人力资本中的"父母学历"、社会资本中"联系频率"，以及家校合作中的"当好家长"、"相互交流"、"在家学习"

等变量对儿童成长有显著的正向影响，且"家校合作减弱家庭资本与儿童成长间的相关性"在中国同样存在。 研究指出，弱势家庭可通过加强与学校的合作，促进儿童成功，这种促进就是"家长参与的力量"。

关键词： 社会资本；人力资本；经济资本；家校合作；教育获得

Abstract: In order to study the regular relations among family capital, family-school partnership and child development, from the perspective of family, we put forward 5 research hypotheses and 1 corollary about the influence on child development from family material capital, human capital, social capital, neighborhood context and family -school partnership according to a large sample data of "Longitudinal Study on School -family partnership of Jungian"。 By the way of ordinal regression model and F test, we find that the neighborhood context has no significant effect on child development with the simultaneous control of children 爷s intelligence, gender and other variables. While "home -place" as one element in family material capital, "parental education achievement" in human capital, "contact frequency" in social capital and "parenting", "communicating"," learning at home" in school-family partnership have significant influences on child development. And we find the phenomenon that family -school partnership weakens the correlation between family capital and child development also exists in China. The study suggests that disadvantaged families can promote child development through strengthening the school-family partnership, which is called "the power of parent involvement"。

Keywords: Social Capital; Human Capital; Material Capital; School -Family Partnership; Educational Achievement

高校毕业生求职结果及起薪的影响因素研究 — —基于 2013 年全国高校抽样调查数据的实证分析

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摘要： 基于全国 21 个省份 30 所高校的抽样调查数据，对高校毕业生的就业状况和毕业生求职结果及起薪的影响因素统计分析。研究发现，高校毕业生的整体"落实率"为 72.0%，毕业生在东部地区、大城市就业的比例更高，企业是吸纳毕业生的最主要单位，毕业生工作的相关度和满意度较高；性别、家庭状况等背景因素是影响求职结果和起薪的重要因素；劳动力市场更加认可反映群体差异的学历、证书、学校类型层级等因素，而非反映个体差异的学习成绩和求职努力程度；就业地区、行业、单位性质等均对毕业生起薪有显著影响。建议加强政府和学校的就业指导，完善劳动力市场及监督机制，扶助弱势群体，保障就业公平，破除招聘中各种限制和歧视，提高高等教育资源配置的均衡性。

关键词： 高校毕业生；就业状况；求职结果；起薪

Abstract: Based on the sampling survey data of national graduates of 30 universities in 21 provinces of China in 2013，the current employment situation，the influencing factors of job-hunting result and starting salary of college graduates have been analyst. The results show that the overall placement rate of college graduates is 72.0%，the proportion of obtaining employment in eastern areas and big cities is higher. The enterprises are the most important units of employing graduates. The job satisfaction and job-major correlation are relatively high. Gender and family background play important roles in job-hunting result and starting salary. Education background，certificate and college level are significant factors in labor market while personal academic performance and efforts to find work are not significant. Employment area，industry and unit property have significant effects on the starting salary of graduates. Therefore，we should reinforce the employment guidance of government and school，perfect the labor market and supervisory mechanism，support the vulnerable groups，safeguard employment equality，break down various restrictions and discriminates in recruitment，and improve the balance of resources allocation of higher education.

Keywords: college graduates, employment situation, job-hunting result, starting salary

课程改革与农村学生的学业成功机会— —基于 A 市八年中考数据的分析

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摘要：农村学生学业成功机会不断下降，引起了社会各界的广泛关注，但已有讨论很少从学校教育的内部机制来分析城乡学生教育机会不均等的原因，忽略了学校课程是城乡不均等"再生产"的一个重要途径。通过 A 市连续八年的学生中考成绩数据发现，课程改革会对城乡学生的学业成功机会的影响比较复杂。从总体平均值来看， "新课程"后，城乡学生的差异没有扩大，甚至有些许的缩小。但在"新课程"改革后农村学生获得高分的机会却明显下降，城乡学生的学业成功机会在不同课程上具有明显的差异。基于不同课程对城乡差异的敏感性，进行政策模拟干预的检验，通过调整不同课程在统一考试中的权重，可以明显地改善城乡学生的教育机会均衡度。

关键词：教育机会不均等；学业成功机会；课程社会学；政策工具；模拟政策干预

Abstract: The gradual decrease of rural students' opportunity of academic success has widely caused social concerns. However, the previous studies have seldom discovered the causes of unequal educational opportunity from the inside mechanism of education, and the reproduction of the urban-rural division through school curriculum has long been neglected. Based on the study of the public examination results of eight years of senior high school entrance examine ion from City A, it is found that the impacts of curriculum reform on urban and rural students' opportunity of academic success are comparatively complex. From the view of general average, the division of urban and rural students has not been enlarged, even narrowed to some extent with the implementation of new curriculum. However, the opportunity for the students to achieve high scores has been decreased obliviously since the reform of new curriculum, and there is distinct gap between the urban and rural students to access to academic success in different subjects. Given the different degree of subject responsiveness to the urban-rural gap in the examination results, it is suggested that we should conduct

the test of policy intervention simulation by adjusting the weighting of subjects in the total score, so as to significantly narrow the urban-rural gap in educational opportunities.

Keywords: unequal educational opportunity, the opportunity of academic success, sociology of curriculum, policy instrument, simulation of policy intervention

我国一流大学的入学机会及其地区差异：2008 －2015

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摘要：近来，各地区一流大学招生公平性问题引起了社会各界的关注。本研究运用主成分分析的方法构建了一流大学入学机会指数，并对 2008 年至 2015 年间 31 个省市地区一流大学的相关数据进行实证研究。研究发现：我国一流大学总体的入学机会有所提高；西部地区获得了较多的招生名额，但由于当地高考报名人数的增加，入学机会的实际增长幅度并不大；此外，受到各地区适龄人口数和高考报名人数差异扩大的影响，地区间入学机会的差异呈现出逐年扩大的趋势。研究进一步采用固定效应模型对入学机会的影响因素进行回归分析。结果表明，目前招生名额的调整对入学机会的改善贡献较弱，而经济发展的变化成为入学机会提高的重要原因，进而导致地区差异的进一步扩大。

关键词：高等教育入学机会；机会公平；地区差异；一流大学

Abstract: In recent years, access to top universities and its regional disparity have become a major concern. With government initiatives launched to improve the quality of higher education through building world-class universities, the research focus is shifting from access to higher education to access to high-quality top universities. This paper first defines the criteria for top universities in China. According to three Chinese universities rankings and four international universities rankings from 2011 to 2015，34 Chinese universities are regarded as top universities in China. In addition, considering several factors in the enrollment procedures in college entrance examinations, this paper

employs the Principle Component Analysis method to construct the index of the access to top universities. Based on province-level descriptive statistics analysis of the access index from both longitudinal trends and horizontal regional-differences, three empirical results were produced. First, the access to the 34 top universities has been increasing year by year at a moderate race, i. e. by about 4. 57%. It is true that an increasing quota has been allocated to west China. However, as more and more students from west China participate in the college entrance examination, the increased access to top universities was attenuated. Therefore, the effectiveness of quota policy on bridging the regional gap is relatively weak. Moreover, as the relevant compensatory policies target some provinces in the middle and western area, provinces in other area, like Iguanodon, Hair, Chongqing and Sicilian, have less support from the central government. Compared with the increasing number of students entering for the college entrance exam, the access to top universities in these provinces is decreasing. Secondly, while in 2015 the regional disparity was reduced, it has been greater in the other years. The phenomenon is most obvious in east China, where the widening gaps in school-age population, the number of examinations and enrollment quotas have aggravated the regional disparity. In terms of the access to top universities throughout the years, cities like Shanghai, Beijing and Tianjin have their comparative advantages, while some other provinces like Iguanodon and Hair, the access is reducing. Finally, using a fixed-effect model, this paper continues to explore the factors that might influence the access index. Results show that, when controlling provincial endowment, though quota reallocation policy may have significant positive effect on the access to the top universities, it contributes little to reducing the access inequality in different provinces. Rather, the economic development becomes the key factor in explaining the variance of access. Therefore, with the widening inequality of the economic development in different provinces, the inequality of opportunity might be greater as well.

Keywords: access to higher education, inequality at regional level; equality of

opportunity; top universities

师范生 TPACK 知识的实证研究

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摘要：师范生受国家公费政策支持，要从事中小学教育教学岗位的工作。当前信息技术发展使他们面临把信息技术整合到未来教学中的挑战。TPACK 知识理论框架在对职前教师专业发展的研究方面取得了较好成果。本研究利用新加坡 Chai,Doh,Saint,& Tan（2011）开发的 TPACK 量表，对我国 463 位大学免费师范生进行了调查。结果发现，与其他研究中职前教师的水平相比，我国免费师范生 TPACK 知识处于较低水平。师范生 TPACK 知识水平受到年级和年龄影响，但在性别方面未表现出显著差异。回归分析结果发现，二维整合知识（TCK 和 TPK）和单一维度知识（CK,TK 和 PK）均对 TPACK 水平存在显著贡献。教师教育机构对师范生提供 ICT 课程时，应考虑到如何通过加强这些基础性知识的学习来促进教师信息技术与课程整合的信心。

关键词：师范生（职前教师）；技术—教学法—内容知识；教师教育；信息技术

Abstract: Free normal students supported by the national policy,will go to the primary or secondary schools to be a teach-er. Current information technology development make them face the challenge of integrating ICT into their instruction. Previous study shows that TPACK framework was a good theoretical foundation for exploring preserver teachers' understanding about teaching in the information age. A survey of 463 preserver teachers in China was conducted using TPACK scale developed by Chai,Doh,Saint,& Tan (2011). Results show that preserver teachers have lower score of TPACK than those in other countries context. Their TPACK profiles were influenced by the age and grade,but there were no significant difference of gender. Regression analyses show that preserver headteacher can be predicted significantly by second-level knowledge of TCK,TPK and the first-level of CK,TK,and PK. Teacher education organization should

consider how to improve their confidence of integrating ICT into teaching through the development of those basic knowledge.

语言能力与大学毕业生的工资溢价

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摘要：本文利用"中国教育追踪调查''（ＣＥＰＳ）数据，以高考成绩和大学英语四级成绩作为学生语言能力的代理变量，分析了大学毕业生的语言能力对就业薪酬的影响效应。研究发现，语言能力中的汉语能力和英语能力对就业薪酬均有显著的正向影响，其中，汉语能力的平均影响力更强；但在工资水平较高的子群体中，英语能力对工资的影响作用更加明显。教学能力对工资的影响效应均不明显。汉语能力和英语能力产生的工资溢价在学生毕业三年内具有持续效果。研究还发现，大学期间积累的人力资本如党员身份、实习经历与证书并不足以解释语言能力对工资溢价的效果。

关键词：语言能力；高考成绩；工资溢价；人力资本

Abstract: This paper estimates the economic return to language ability for college graduates in China by using data from Chinese Education Panel Survey(CEPS). Tests scores in the College Entrance Examination and CET-4 are used as proxy variables to students' ability. The empirical results show that both English and Chinese language ability have significantly positive effects on wages for graduates with the influence of Chinese language ability being stronger in general, while the effects of English proficiency being larger in the subgroup with higher wage levels. The influence of mathematics ability is not significant. The wage premiums of Chinese and English language ability have lasting effects in the following three years after graduation. The results also indicate that the wage premium of language ability cannot be explained by the human capital

accumulated in college.

师范生整合技术的学科教学知识（TPACK）发展研究——基于微课开发案例的分析

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摘要：继舒尔曼提出学科教学知识（PCK）之后，整合技术的学科教学知识（TPACK）逐渐成为教师知识的一个核心要素，成为教师专业发展的重要组成部分。如何科学有效地促进教师 TPACK 的发展，逐渐成为教育理论研究和实践应用中的热点问题。这个问题不仅关系到教师知识体系的建构，也关系到教师的专业成长，更进一步说，甚至关系教育理论和实践的前景和未来。本研究以微课开发项目为基础，旨在探究参与到活动中的师范生的 TPACK 发展。研究的主要问题是探究参与微课开发的师范生的 TPACK 发生了什么样的变化，微课开发从哪些方面促使了这些变化的产生，影响参与者 TPACK 发展的因素有哪些。

研究对象是研究者以招募的方式从所在师范大学里物理教育专业中产生的八名大二师范生。他们每人都经历了二轮个人访谈和四轮微课开发循环，涉及微课的设计、制作、点评、修改和提交等环节。研究者通过访谈、参与式观察、问卷调查等形式收集研究资料，利用 N vivo 11.0 质性资料分析软件进行资料编码和分析。研究结果表明：基于学科知识教学的微课开发项目活动可以有效地促进师范生在课堂教学中整合技术运用的思想意识和知识能力的形成和发展，促进他们对于技术、教学法与学科内容之间密切联系的理解，从而有效地促进他们 TPACK 水平的发展。

本研究共包括四个主要部分，包括：导论和文献综述；研究设计；研究历程和主要研究发现；研究结论和反思。首先，本研究对国内外 TPACK 研究、微课开发的理论和实践等资料进行收集和整理，梳理出相关研究的现状和问题，并对选题的缘由、主要研究问题和研究假设、核心概念和理论基础等进行了阐述。其次，在案例研究设计及实施策略的部分，我阐述了本研究的研究背景、采用的主要研究方法和资料收集手段，着重描述了本研究的资料收集和分析方案。研究历程和研究主要发现是本文的主体部分，详细描述了案例研究方案的整合实施过程细节，并采用 TPACK 框架对研究发现进行分类呈现。最后，在研究资料呈现和分析的基础上，验证了研究假设一˜假设四，对竞争性研究假设予以反证，从

而得出本研究的四个研究结论和一个总结论，并验证了研究结论的效度和信度。同时，研究者也对整个研究活动进行对了深入的反思，提出了几点启示和建议。

本研究在理论层面上，进一步验证和丰富了整合技术的学科教学知识（TPACK）的理论框架，使其具备了师范生、微课开发等这些血和肉的融入；在实践层面上，为师范生乃至在职教师的课堂技术整合的意识和能力的发展提供了一条全新的、基于微课开发的路径。

关键词：整合技术的学科教学知识（TPACK）；师范生；发展；微课开发

Abstract: Ever since Shaman proposed the concept of the Pedagogical Content Knowledge (PCK), the Technological Pedagogical Content Knowledge (TPACK) has gradually become a core element of teachers' knowledge and an important part of teachers' professional development. How to promote the development of teacher TPACK scientifically and effectively has become a hot issue of theoretical research and practical application in the field of education. This is not only related to the construction of teachers' knowledge system, but also to the professional development of teachers. This study is based on the development of micro-courses, which aims to explore the TPACK development of the students participating in the activities. The thesis tries to probe into the following questions: what changes of TPACK has happened on these normal students who have participated in the micro-course development; in which aspects the development of micro-course result in these changes; what factors affect the development of TPACK of those participants. The subjects of this study are eight sophomores majoring in physical education who are recruited from normal universities. Each of them has gone through two rounds of personal interviews and the four rounds of micro-course development cycle, involving the micro-courses' design, production, review, revision and submission. The researchers have collected data through interviews, participant observation, questionnaires, etc, and N vivo 11 qualitative data analysis software has been used for data coding and analysis. The results show that: micro-courses development project activities based on knowledge teaching can effectively promote the formation and development of normal students' awareness, knowledge and ability of integrating the application of technology in classroom teaching, deepen their understanding

of the close relationship between technology, teaching methods and subject content, and consequently promote the development of their TPACK levels effectively. This study consists of four main parts: introduction and literature review, research design, research process and the main findings. In the first part, the researcher tries to sort out the status duo and problems of related research by collecting and collating data on the domestic and overseas TPACK research as well as micro-course development theory and practice, and introduces the reason of the selection of the topic, the main research questions and hypotheses, core concepts and theoretical basis. The second part introduces the research background, the main research method and data collection method, with the emphasis on the data collection and analysis program. The third part is the main body of this dissertation including the research progress and the main findings of this study. The details of the implementation of the case study are presented, and the research findings are classified in the TPACK framework. In this last part, based on the research and analysis, the research hypothesis 1~6 will be verified, and the competition hypothesis will be refuted, which will naturally lead to six conclusions obtained, a summary of the theory and consequently the validity and reliability of the research conclusion. At the same time, the researcher have also carried out a deep reflection on the whole research activities, and put forward some enlightenment and suggestion. The study, on the theoretical level, further validates and enriches the teaching knowledge integration technology (TPACK) framework, which integrates the elements of normal students, micro-course development and etc.; on the practical level, it provides a new way of promoting normal students' and even in-service teachers' awareness and ability of integrating technology in classroom teaching.

Keywords: Technological Pedagogical Content Knowledge(TPACK); normal student; development; micro-course development

促进学习投入的混合教学设计与教学行为研究

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摘要：近年来，随着高校信息化建设的发展和教学改革的深入推进，混合教学日益成为一种重要的教学形式。如何创建有效的混合教学环境，改善教师教学行为，促进学生学习投入水平的提高是当今高校有效开展混合教学亟待解决的问题。研究通过分析混合学习及学习投入领域研究成果，针对高等教育教学提出混合教学设计促进学习投入的关键原则，并以学习活动设计为中心，构建促进学生学习投入的混合教学设计框架。研究采用基于设计的研究方法，通过确定问题、设计开发、实施验证、分析评价和完善优化的研究过程，经过两轮循环迭代，验证并完善了混合教学设计框架及策略。

研究表明，本研究混合教学设计框架与策略总体上能较大程度提高学生学习投入。学生在主动学习、师生交互、小组协作、策略运用、自我管理和情感投入六个投入维度均有较高水平。同时，教师的教学行为在设计组织教学、促进参与、直接指导、反馈评价、提供资源与情感支持六个维度也有较好表现。研究发现，学生性别、在线学习经验以及计算机自我效能都能够影响混合教学下学生的学习投入。混合教学中，教师的教学年限能够显著影响其教学行为，教师教学行为对学生学习投入水平有积极的影响。从教学行为具体维度对学习投入的影响来看，在决定学习投入水平的教学行为中，"设计组织教学"行为最能显著预测学习投入行为， 而"促进参与"与"反馈评价"行为也对学习投入有较强的影响力。此外，本研究通过聚类分析，根据学习投入六维度特征对混合教学下学生学习类型进行分类，得到全面投入型、独立学习型、协作学习型、被动投入型四种学习类型，探究了每种类型的学习投入特征，并进行了不同学习类型性别及年级比较分析。

关键词：学习投入；混合教学；混合学习；教学行为

Abstract: Recently, with the development of university dramatization construction and reform in education carrying forward, blended instruction has increasingly become an important form of teaching in higher education. How to develop effective blended instruction environment, improve instructor's practice, and enhance the level of student engagement is a key issue to be solved . Based on theories and practices of blended learning and student engagement, this dissertation has proposed pivotal principles,design framework and strategies of blended instruction which could enhance student engagement

level. After two round of iteration, this research has validate and optimization design framework and strategies. This research has categorize student engagement in blended learning into comprehensions, including active learning, instructor-student interaction, team collaboration, strategy implementation, self-management and emotional engagement. Meanwhile, instructor practice has also been divided into six dimensions, including constructional and organization, facilitating participation, direct instruction, feedback an devaluation, providing learning resources, and emotion support. After application of prostheses framework and strategies, student engagement at the six dimensions has showed high level. The research also found that students' gender, online experiencing and computer self-efficacy could actively affect student engagement level. Moreover, teaching period is positively related to instructor practice. Most importantly, instructor practice has significantly influenced student engagement level. In addition, instructional design and organization is the most important predictor of student engagement, while feedback and evaluation, and facilitating participation also have a strong impact on student engagement. Furthermore, through cluster analysis, deportation has classified student learning types in blended learning into four categories according to the six dimension of student engagement. All of those results have Providence theoretical basis and practice guidance for further research development.

Keywords: student engagement; blended instruction; blended learning; constructional

幼儿园教师课程设计能力研究

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摘要：课程设计能力是幼儿园教师教育能力的综合体现，是教师专业发展的核心，是幼儿园教育质量提升的关键，事关学前教育事业的整体推进。在研究方法上，本研究遵循"量

的研究"和"质的研究"两种范式；在研究结构上，包括幼儿园教师课程设计能力现状与影响因素探析、幼儿园教师课程设计能力应然表征、幼儿园教师课程设计能力提升三个子研究；研究对象为甘肃省 14 个市州的幼儿园教师。

量化研究采用问卷调查法进行大样本调研，运用 SPSS19.0 和 AMOS21.0 软件对数据进行分析。在现状研究方面，根据文献源与幼儿园教育实践源途径自编"幼儿园教师课程设计能力表现水平测量问卷"，问卷共计五个量表 46 个题项；运用 SPSS19.0 软件对 282 份有效预试问卷进行决断值检验、题项与总分相关分析、探索性因素分析、信度检验，删除 3 个无效题项，最终形成正式问卷；正式问卷对 1510 位女教师、59 位男教师进行采样，再次运用 SPSS19.0 软件对 1569 份有效问卷进行信度检验与探索性因素分析，运用 AMOS21.0 软件对量表的模型匹配度、收敛效度、区分效度进行检验；数据分析结果表明自编问卷具有良好的信度和效度，采样数据能有效反映幼儿园教师课程设计能力的现状。在影响因素研究方面，根据理论建构出"幼儿园教师课程设计能力结构模型"，运用 AMOS21.0 软件对初识模型进行运算，参考修正指标，在不违背理论基础与经验法则的原则上，建立误差变量的相关关系；再对修正模型进行拟合运算，拟合度全部达标，得出修正后的路径系数图；数据分析结果表明，结构模型的运算结果可以有效反映幼儿园教师课程设计能力内部因素之间的影响关系。

质的研究采用文献法、访谈法、观察法、文本分析法对理论基础和教育现象进行梳理与分析。文献研究法以哲学、心理学、教育学、课程理论为基础，筛选出幼儿园教师在课程目标设计能力、课程内容设计能力、课程实施设计能力、课程评价设计能力层面的应然表征。访谈法根据自编"幼儿园教师课程设计能力表现水平访谈提纲"对 70 位教师、29 位园长进行访谈。观察法共对 33 位教师的教育活动进行观察，并选取具有代表性的 12 次课程实例作为案例分析样本。文本分析法对搜集的幼儿园课程月计划、教育活动周计划、教育活动方案、教材、教学反思、幼儿记录表等内容进行分析。

幼儿园教师课程设计能力现状表现为：教师的总体课程设计能力及各层面能力在不同民族、年龄、教龄、学历、职称、编制、专业、转岗、区域、性质、等级背景变量上均存在显著差异；幼儿园教师的课程目标取向平衡能力、课程目标来源整合能力、课程目标组织能力、课程目标表述能力、课程内容取向选择能力、课程内容组织能力、课程实施取向协调能力、课程实施组织能力，课程评价取向确定能力、课程评价组织能力整体较弱；教师的自我能力满意度较高；教师的自我评价与专业评价形成鲜明对比。

幼儿园教师课程设计能力内部影响因素表现为：课程认知、课程目标设计能力、课程

内容设计能力、课程实施设计能力、课程评价设计能力、能力满意度各因素之间存在一定的相互影响关系；教师课程自主权的缺失导致课程内容设计能力违背理论规律：课程认知未成为课程设计的主导因素，教师不是根据课程目标选择课程内容，而是直接选用教材并对目标进行修改，课程实施与评价重视课程目标的引导。

其次，外部的职前培养、幼儿园管理、家长期望、教育行政部门管理、教育管理体制、社会经济通过教师的教育理念、专业知识、专业能力最终实现对课程设计能力的综合影响。

幼儿园教师课程设计能力现状与应然表征的差距表现为：教师缺乏生成性目标与表现性目标取向，缺乏对幼儿身心特点的把握能力，缺乏专家指导，缺乏对"过程与方法"目标的重视，目标表述缺乏完整性、一致性、准确性、有效性、可行性；缺乏课程内容的经验选择取向，缺乏纵向式与横向式组织能力、直线式与螺旋式组织能力、逻辑顺序与心理顺序组织能力；缺乏课程实施的创生取向与相互适应取向，缺乏完善的课程准备能力，缺乏游戏组织课程的能力，缺乏有效师幼互动的能力；缺乏课程评价的过程取向和教师主体取向，缺乏形成性评价和量化评价组织能力，质性评价组织能力低。

通过对 Q 园徐老师的行动研究结果表明，幼儿园教师课程设计能力提升策略应主要从七个方面开展：一是转变教师思想观念以重建主体思想意识，包括启发教师树立"引导、支持、发展"的教育观，树立"平等、自由、信任、尊重"的儿童观，树立"以幼儿为中心、游戏为形式、体验为目的"的课程观；二是倡导教师自主学习以提升主体内在素质；三是保教实践结合以修炼主体品格与能力；四是增强教师的课程自主权以创生主体课程意识；五是优化职前教育体系，培养优质师范后备力量，包括严把入学招生条件、优化教育培养质量、严格人才输出路径；六是完善园本管理机制，营造教师卓越发展的人文化环境，包括"学与教共同体"的环境支持，建立高校和研究机构的专业合作纽带，家园合作实现有效沟通；七是转换上级行政角色，为教师发展提供支持性条件。

Abstract: Curriculum design ability is an overall representative of teaching ability for kindergarten teachers, it's the key for teaching quality improvement and the core schoolteacher self-professional development, and it's also the overall advancement homeschooling education. In the research methods, the research follows two paradigms of"quantity research" and "qualitative research"; in terms of research structure, it includes exploration and analysis

on current situation and influencing factors of kindergartens curriculum design ability, the theoretical state of kindergarten extracurricular design ability, and how to promotion it. The object of the study is all kindergarten teachers in Ginsu province.The quantity research is adopt questionnaire survey method to collect data, analyses it by SPSS19.0 and AMOS21.0. In the status study, it according to the theory and practice to design the "performance level of kindergarten teacher's curriculum design ability" which includes five scales and 46 questions. Then use SPSS19.0 to analyze the282 effective preliminary test by critical ration, correlation analysis of item and total score,exploratory factor analysis (EFA) and reliability analysis, delete 3 invalid items to Norma formal questionnaire finally. It Izvestia 1510 female and 59 male in the formal test, useSPSS19.0 to analyze these by EFA and reliability analysis, use AMOS21.0 to analyze these by model matching test, discriminant validity and convergent validity test. Analysis results show that the questionnaire has good reliability and validity, the exampled can effectively reflect the current situation of kindergarten teacher's curriculum ability. In the influencing factors study, according to theory to construct "model kindergarten teacher's curriculum design structure" which use AMOS21.0 to analyzable. Then according to the correction index and Establishment the correlation of error variable theory and practice, until the fitting degree is all up to standard and the revised efficient diagram is obtained. Data analysis results show that operational results infrastructure models can effectively reflect the influence relationship of teachers' curriculum capability.The qualitative research uses literature method, interviewing method, observation, and text analysis to sort out the theoretical characterization and analyze coeducational phenomena. Firstly, the study uses literature method based on philosophy,psychology, pedagogy, and curriculum theory to find out the theoretical characterization of kindergarten teacher's curriculum goal design ability, curriculum content design ability,curriculum implementation design ability, and curriculum evaluation design

ability.Secondly, it uses interviewing method to interview 70 teachers and 29kindergartenleaders. Thirdly, it uses observational method to observe 33 teachers' curriculum, deselection representative 12 course examples as case analysis samples. Fourthly, it uses extensional to the collected data of monthly plan, education activity week plan, education program, teaching materials, teaching reflection, child record table and so on.The present situation of kindergarten teachers' curriculum design ability infested as that there are significant differences about namely, age, career duration,ethic, title, educational background, personnel establishment, professional study, location,sponsor and kindergarten ranks in teachers' whole and all levels curriculum design ability;kindergarten teachers' curriculum goal orientation balance ability, curriculum goal integration ability, curriculum goal organization ability, curriculum goal impressionability, curriculum content orientation selection ability, curriculum content interchangeability, curriculum implementation orientation coordination ability, complementation organizational capability, curriculum evaluation nondenominational ability, curriculum evaluation organizational capability are on the lakeside; there are obvious gaps between self and professional evaluations; teachers enjoy higher satisfaction with personal confidences.The influencing factors of kindergarten teachers' curriculum design ability are as follows. Curriculum cognition, curriculum goal design ability, curriculum content design ability, curriculum implementation design ability, curriculum evaluation design ability,ability satisfaction factors exist some mutual influence relations; however, the loss bleacher's curriculum autonomy leads to the violation of the theoretical rules of counterrevolution design: curriculum cognition is not the dominant factor in curriculum design, headteacher does not select the course content according to the curriculum objective, but chooses the teaching material directly and modifies the target, and the complementation and evaluation pay attention to the curriculum goal. The exterior factors such as ore-professional education, kindergarten management, management of the upper-level authorities, parents and

social economy have influences on teachers' profession, knowledge and competence, which ultimately works on curriculum design ability of kindergarten teachers.The gap between the present situation of kindergarten teachers' curriculum design ability and the proper representation are as follows. Teachers lack of generation goal and performance goal orientation, lack of ability to grasp the children's physical and characteristic, the lack of expert guidance, lack of the goal of "process and method"attention, expression of a lack of integrity, consistency, accuracy, validity, feasibility.Lack of experiential orientation of curriculum content, lack of vertical and disorganization capabilities, linear and spiral organizational capabilities, logical order analogical order, organizational capabilities. Lack of creative orientation and adaptive orientation of curriculum implementation, lack of perfect curriculum preparation ability,lack of the ability of game Organization curriculum, lack of effective interaction between teacher and child. Lack of curriculum orientation and teacher orientation, lack Reformation assessment and quantitative evaluation of organizational capacity, qualitative capacity is low.Through the action research headteacher Bu that enhance the kindergarten extracurricular design ability strategy should be mainly from seven aspects. The first is changeover the teachers' ideas to reconstruct the subject consciousness of thought, including the inspiring teachers establish "guidance, support, development" concept of education,establish the "equality, freedom, trust and respect" concept of children, establish a "child centered learning experience, the game as a form, for the purpose of experiences" concept curricular; Second is to promote teachers' self-regulated learning in order to improve subject quality; Third is to practice teaching practice subject personality and ability;Fourth is to enhance teachers' curriculum autonomy to the creation of subject conscientiousness; Fifth is to optimize the ore-service education system, cultivating high quality normal reserve forces, including strict admission conditions, optimize the equality education and training, strict personnel output path; Sixth is to improve the engagement mechanism,

constructing teachers'development of cultural environment,including "learning and teaching environment" support, the establishment of communities and research institutions, professional and cooperative ties and cooperation to achieve effective communication; Seven is the conversion of superior administrate, providing supportive conditions for teachers'development.

Keywords: kindergarten teacher; curriculum design ability; status;influencing factor; promotion

小学低段数学符号意识测评模型构建研究

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摘要："符号意识"是《义务教育数学课程标准（2011 年版）》（以下简称《标准》）的核心概念和重要内容之一，也是数学素养的重要组成部分。对小学生而言，最先接触到的数学符号是数字符号，继而会认识逐步到关系符号、运算符号等。而数字符号的学习是学习数学从具体到抽象、直观到概括的第一步，对数学学习发展十分重要。可以说，小学低段数学符号意识是小学生数学抽象思维形成的第一步，是数学核心素养（数学抽象）的重要组成部分，也是人的抽象思维形成的基础，十分重要。然而，学界对小学低段数学符号意识的认识并不一致，甚至对小学低段数学符号意识是否存在还有分歧。对小学低段学生数学符号意识的现状如何？是否可以测评？能否构建出一个可以测评的工具？这些问题都是值得研究的问题。可见，小学低段数学符号意识测评模型的构建是数学教育学中亟待探讨和研究的问题，它是数学、教育学、心理学和统计学等交叉领域的一个研究问题，研究有相当大的难度。目前国内外对小学低段数学符号意识测评模型的构建研究还几乎是空白。本文通过对小学低段数学符号意识的理论和实证研究，尝试构建出小学低段数学符号意识的测评模型，这对小学生数学符号意识、数学素养的培养和发展，以及对人的抽象思维的形成和发展都具有积极而重要的研究意义。

本研究运用了文献资料、调查研究、统计分析等方法开展对小学低段数学符号意识测评模型构建的相关研究。首先，运用文献资料方法，收集、整理和分析国内外有关小学低段数学符号意识的文献、电子资料和小学一二年级数学教科书，并对其存在性、含义、表现形式和操作性定义进行系统分析和归纳，初步形成小学低段数学符号意识的理论分析框

架。其次，通过专家咨询（高校知名数学教育和教育统计方面专家，以及一线优秀数学教师和一线优秀教研员，各类专家共 30 人，咨询次数达 60 人次以上）、课堂观察（1～5 的认识）、问卷调查(1880 份学生测试卷和 1138 份专家调查问卷)等调查形式对小学低段数学符号意识的内涵维度和行为因素进行调研数据的收集。最后，对调研数据进行统计分析（探索性因素分析、验证性因素分析、层次分析法、卡方检验、F 检验、T 检验），最终构建出小学低段数学符号意识测评指标和测评模型。

本研究尝试用教育统计的方法和思路去构建基础教育中的测评模型，即探索从"小学低段数学符号意识的含义→表现形式→操作性定义→内涵维度的确定→测评指标的筛选→测评模型的构建→测评模型的检验"的一种测评模型构建的研究思路。整个研究共分为四个步骤：第一步，分析框架的构建；第二步，测评指标的确定；第三步，测评模型的构建；第四步，测评模型的检验。在这四个研究步骤中发现：界定小学低段数学符号意识的操作性定义、确定小学低段数学符号意识的测评指标，以及构建和验证小学低段数学符号意识的测评模型是研究的重点；编制小学低段数学符号意识调研工具（学生测试题目）和确定小学低段数学符号意识的内涵指标是研究的难点。

论文共分为 7 章：第 1 章，绪论。主要分析了小学低段数学符号意识的研究背景和研究意义，并科学界定本研究的相关核心概念。第 2 章，文献综述。收集和整理了国内外有关数学符号、符号意识和基础教育中有关测评模型构建的研究成果，初步获得符号意识的理论研究基础和研究思路。第 3 章，研究设计。主要介绍论文的研究思路、研究方法、解决的问题和创新点。第 4 章，有关问题探究。着重探讨了小学低段数学符号意识的存在性、含义及其表现形式，以及科学界定出小学低段数学符号意识行为描述的操作性定义。第 5 章，测评指标的构建。主要从实证研究视角，探析小学低段数学符号意识的内涵指标和指标所表现出来的行为因素，通过探索性因素分析和验证性因素分析，筛选出小学低段数学符号意识的测评指标。第 6 章，测评模型的构建和检验。运用模型构建的一般方法和步骤，并结合小学低段数学符号意识的本质，构建出小学低段数学符号意识的测评模型，通过对统计量和模型教育意义的检验，说明和验证测评模型的可行性和有效性。第 7 章，结论与反思。总结和呈现研究的主要结论、存在的不足和进一步深入研究设想。

本研究的主要结论：（1）小学低段数学符号意识存在且非常重要，其含义是指学生对数学符号的感知、认识、理解、运用等方面所作的一种反应，这些反应具体反映在学生对数学符号抽象过程的体会，对数学符号认识、读写、理解、掌握和运用等方面的能力表现。

（2）小学低段已涉及多种符号类型，如元素符号、运算符号、关系符号等，学生对每一类数学符号都体现出不同符号意识的表现形式。如正确认、读、写 5 以内的数，能用数去表示物体的个数和顺序，会区分几个与第几个；认识"="、"<"、">"，能正确读写和理解其含义，会用符号描述数的大小；认识加号"+"、减号"−"，能正确读写加、减法算式，初步理解它们的含义，并能运用它们去解决简单实际问题。（3）界定小学低段数学符号意识行为描述的操作性定义，即：1）从具体情境中概括并抽象出数、数量关系和空间形式的属性，并用抽象的统一记号去表示属性；2）识别不同类型的数学符号，并能规范读写；3）知道符号所代表的含义；4）根据符号间的区别和联系，按照数学的规则对符号进行操作；5）运用符号表示数、数量关系和变化规律；6）通过对数学符号的运算和推理解决具体情境中的简单问题。（4）通过实证研究初步构建并验证了小学低段数学符号意识的测评指标，即由 3 个一级内涵维度指标：数学符号的抽象、数学符号的识记和数学符号的应用，7 个二级行为因素指标：1）概括具体情境中有关数、数量关系和空间形式的属性；2）用抽象的统一记号表示上述属性；3）识别不同类型的数学符号，知道符号的读法和写法；4）知道数学符号所代表的含义；5）按照数学的规则对数学符号进行操作；6）运用符号表示数、数量关系和变化规律；7）通过符号的运算和推理解决具体情境中的简单问题。（5）构建小学低段数学符号意识的测评模型，即 $Y=0.3X_1+0.3X_2+0.4X_3$（其中 Y 表示学生符号意识综合测评值，X_1 表示数学符号的抽象得分，X_2 表示数学符号的识记得分，X_3 表示数学符号的应用得分），模型的准确率为 70.56%。并通过对统计量和模型教育意义的检验，说明和验证了模型的可行性和有效性。

本研究的创新之处：首次探析了小学低段数学符号意识的含义、表现形式，并给出小学低段数学符号意识的操作性定义；首次构建并验证了小学低段数学符号意识的测评指标和测评模型。

经过四年的潜心调研和深入研究，虽然相关研究成果（如"小学低段数学符号意识的含义及其表现形式"、"小学低段数学符号意识测评指标体系的初步构建"等）得到了国内教育学中主流期刊的刊载，这为后续研究增添了信心。但由于小学低段数学符号意识测评模型构建是一次尝试性的研究工作，在研究中还存在诸多不足，主要包括：（1）数学符号意识的相关理论还需要进一步探究，尤其是测评指标中行为因素个数的问题；（2）小学低段数学符号意识调研工具（测试题）的信效度和测评模型的准确率需要进一步提高；（3）测评模型构建过程中所选取的样本量和代表性不够。因此，后续进一步深入研究，力图扩大研究范围，做出符号意识的测评常模，为广大一线教师培养和发展学生的数学符号意识

提供可操作的标准。

关键词：小学低段；数学符号；符号意识；测评模型；模型构建

Abstract: Symbol sense which is an important part of the mathematics literacy is also Central concept in the 2011 version of the Curriculum Standard for Compulsory Education (the Standard). For elementary school students, the first mathematics they contact are numeric symbols then the relational symbols and operation. Meanwhile, numeric symbols are not only the first step for students to learn mathematics from concrete to abstract, and from intuition to generalization, but also important for their development in mathematics learning. Subsequently, mathematics sense is the first step in developing abstract thinking for elementary school students. It is both the foundation for the development of abstract thinking and an important constituent part of the core quality of mathematics. However, there has been consensus among scholars on the understanding of mathematics symbol sense at lower elementary school level, even the question "whether mathematics symbol sense exists at lower elementary school level "is not sure, and if exists, whether it can assured and how are still unknown. In view of this, developing a measurement model to measure mathematics symbol sense of students at lower elementary school level is an urgent question both in the field of mathematics education and across multiple areas like mathematics, pedagogy, psychology and statistics, which has great difficulty to be explored. There has been almost no instrument available for measuring the level mathematician symbol sense of students in lower elementary school so far. The research at developing a measurement model of mathematics symbol sense at complementary level through theoretical and empirical studies which is contribute to development of mathematics symbol sense and abstract thinking of elementary school students. With comprehensive usage of literature research, questionnaires and anachronistically, the research explores the measurement model of mathematics symbol sense in lower elementary school. Through literature review and document analysis, the research performed a theoretical analysis of the existence, meaning, ways of expression and

operational definition of mathematics symbol sense at lower elementary school level. An empirical study of the construction of a system of evaluation indicators and a measurement model of mathematics symbol sense at lower elementary level was also performed through varieties of methods including interviews with experts and headteacher the field, questionnaire survey, classroom observation, and statistical analysis. Based on the methods and approaches from studies of developing a tool for basic education evaluation, a kind of creative research direction and steps were set developing the measurement model of mathematics symbol sense in lower complementary, and the following process was explored: "The meaning of mathematics symbol sense at lower elementary school level→ways of expression→operational definition→determination of the constituent indicators→construction and verification of the system of evaluation indicators→construction and verification of the measurement model→application". At first, the meaning and operational definition of mathematics symbol sense were analyzed theoretically, then exploring evaluation indicators and countermeasure model would be verified and built, among of which, the aberrational of mathematics symbol sense and its evaluation indicators are focused during research. Meanwhile, it is difficult to select indicators and test mathematics symbol sense of students at lower elementary school level. The thesis comprises 7 chapters. Chapter 1 is the introduction. It mainly analyze research background, concepts and significance of mathematics symbol sense at lower elementary school level. Chapter 2 is literature review. It mainly analyzed and critiqued research findings related to mathematics symbols and symbol sense national internationally. Chapter 3 presents the design of the research. It mainly introduced the research direction, research methods, the problems to be solved and the contribution of the research. Chapter 4 reports the theoretical analysis of the study. It mainly analyzed the existence, meaning and ways of expression, and the aberrational of mathematics symbol sense at lower elementary school level. Chapter 5 presents the construction of the system of evaluation indicators. It

mainly analyzed Constitution and behavioral factors of the indicators from an empirical perspective.Through exploratory factor analysis and confirmatory factor analysis, the contraindication for mathematics symbol sense at lower elementary school level and their weightings were determined. Chapter 6 reports the verification and construction of remodel. It mainly explored the process of converting the system of evaluation indication a measurement model, and verified the applicability of the model through elastically. Chapter 7 reports the initial application of the model. In a sense, this chapter is States of the educational value of the model, including mainly analyses of the current of mathematics symbol sense of lower elementary school students and difference between schools and grades, and an exploration of the strategy developing mathematics symbol sense for students at lower elementary school level.Chapter 8 summarizes the major findings of the study, discusses the significance of findings, points out the limitations of the study, and ends with the conclusion of the study.The main conclusions of the research are:Firstly, mathematics symbol sense does exist and is of great importance at complementary school level. It refers to the reaction of students to the perception,recognition, understanding and application of mathematical symbols, which reflected in the process of understanding abstract mathematical symbols, and the performance definition, reading and writing, mastering and application of mathematical symbols.Secondly, many types of symbols are involved at lower elementary school level,including Element symbols, Operation symbols, Relation symbols, etc. Students different ways of expressing each type of mathematics symbols.Thirdly, operational definition of mathematics symbol sense at lower complementary level is: 1) generalizing and abstracting the attributes of number, numerical relationship and Spatial form from the concrete situation and can describe with undignified;2) recognizing different types of mathematical symbols and knowing how to Ireland write; 3) understanding the meaning of symbols; 4) based on mathematical rules cooperate symbols according to the differences and relations between symbols; 5) symbolism to express numbers, numerical relationship and

changes; 6) solving problems in the concrete context by computing and reasoning mathematical symbols.Fourthly, a system of evaluation indicators for mathematics symbol sense at complementary school level is tentatively constructed and verified through empirical, namely 3 first level indicators in the content dimension (Abstraction mathematician symbols, Identification of mathematics symbols, and Application mathematician symbols), 7 second level indicators in the domain of behavioral factors: 1)generalizing the attributes of number, numerical relationship and Spatial form from concrete situation; 2)describing the attributes with unified mark; 3) recognizing different types of mathematical symbols and knowing how to read and write;4)understanding the meaning of symbols; 5) operating symbols based on mathematical rules;6) using symbols to express numbers, numerical relationship and changes; 7)solving simple problems in the concrete context by computing and mathematical symbols.Fifthly, an assessment model(named as $Y=0.3X_1+0.3X_2+0.4X_3$) accuracy rate 70.56% for mathematics symbol sense at lower elementary school level built. The feasibility and validity of the model are illustrated and tested thermostatically verification.The innovation of the research includes: exploring the meaning, ways expression and operational definition of mathematics symbol sense at lower complementary level for the first time; construction of a system of evaluation indicators and a measurement model of mathematics symbol sense at lower elementary level is also studied for the first time.Research on mathematics symbols sense at lower elementary school level achieved initial success through four years' study, including "The meaning mathematician symbol sense and its ways of expression in lower primary school" and "A first step in the construction of a system of measurement indicators for mathematics sense in lower elementary school", which have been identified,recognized and encouraged by varieties of domestic journals laying foundation for further research Aswan as increasing our confidence and motivation. But in view of it is just an attempt research on the measurement model of mathematics symbol sense in lower complementary ,there are still many

limitations in our research, including mainly:(1) The theoretical analysis in the research still needs to be further strengthened;(2) The reliability and validity of the test items on mathematics symbol sense at lower elementary school level still needs to be further improved and perfected;(3) The accuracy rate of the model needs to be improved.Therefore, research areas will be expanded and preliminary norm of symbol sense will be explored consciousness in the future, which will provide an operational standard for cultivating and developing mathematics symbol sense of students for teachers.

高校专项计划影响下的农村学生择校行为研究

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摘要：我国以高校专项计划等形式向贫困地区及农村地区生源倾斜，有效地解决招生过程中存在的城乡不公等问题，进一步提高农村学生上重点大学的机会，丰富高校招生的渠道与类型。但是，该计划仍存在较重的地域色彩，招生结果存在区域的差异。研究猜测，这是由于农村学生在择校时，受到了某些因素的强烈影响，当面对高校专项计划的干预时，影响因素将发生改变，找到这些核心的影响因素及变化趋势是研究解决的关键问题。

　　本研究以高三应届农村户籍的学生为研究对象，通过问卷调查与实验的方法，具体分析当他们获得了高校专项计划及其他信息的情况下，择校行为的改变以及影响择校因素的变化。研究发现：第一，经济因素与学生能力对农村学生的择校具有显著的影响作用，但影响效果与机制不同；第二，高校专项计划信息促进学生向外省流动，可以矫正经济因素的"干扰"，强化能力对择校的作用，且信息越充分，影响效果越强；第三，在所有学生都获知高校专项计划的情况下，学生能力是最主要的影响因素。但是，额外的成本与资助信息对经济与能力因素产生不同的影响效果。

　　由此，基于高校专项计划的作用，研究提出三点建议：应加强政策宣传力度，找到贴近农村学生特点的信息发布方式；应完善实施高校的信息发布内容，特别是在实施高校专项计划时提供关于国家及大学的资助信息；应强化高中层面的信息公开与监督，避免在高

中层面发生信息的断裂。

关键词：农村学生；择校行为；高校专项计划；经济因素；学生能力

Abstract: Students of poor areas and rural areas have the chance to go to college by meanness the University Special Program in China. The program can effectively solve funfair enrollment between urban and rural area. It also can improve the opportune rural students to go to better universities, and enrich the channels and types collegian enrollment. But, the program still has a controversially biographical result. This research speculates that when choosing the college, rural students are strongly influenced by some factors, and if they know the Universality Program, they may change the decisions. Finding out these influencing factor sand their variation trends is the key problem of this paper. The research, taking the senior three rural students as the objects by means of questionnaire and experiment, analyses how they choose colleges and how influenced factors of decisions change, when students get the University Overspecialize and other information. The research finds that, firstly, economic factors studentship ability have significant impacts on rural college choice, but their effects and influencing mechanisms are different. Secondly, the information of the Universality Program promotes students to flow to other provinces, and it can correct interfere of economic factors, strengthen the effect of ability on college choice. The more information students get, the stronger effect information will have. Thirdly, Alhena the students know about the University Special Program, students' ability is the most important factor to the college choice. But, additional costs and funding information have different effects on economic factors and ability. Above all, this paper puts forward three suggestions for the University Overspecialize. Firstly, government should strengthen the policy advocacy efforts to the rural students, by using information publication, which is close to the rural students. Secondly, universities of the program should improve information content, especially providing funding information on national and universities. Thirdly, high schools should publicize the program information. They should be

supervised by the societal order to avoid the rupture of information.

Keywords: Rural Student; College Decision-Making; University Overspecialize; Economic Factor; Students' Ability

高中生数学核心素养评价研究

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摘要：数学核心素养是现代社会公民适应终身发展和社会发展的必备品格和关键数学能力，是新一轮基础教育数学课程改革的焦点，是国际数学教育研究的重要主题。对高中生数学核心素养现状进行评价研究，不仅符合当前国际数学教育研究的发展趋势，更是深化数学教育教学改革的现实需求，具有一定的理论意义和实践价值。

本研究对高中生数学核心素养现状进行评价，主要调查两个方面的问题：一是高中生数学核心素养测评工具的研制，二是高中生数学核心素养现状探析。研究继续将第二个问题分解为 3 个子问题：（1）高中生数学核心素养的总体状况如何？在五个维度（教学内容、评价指标、水平、情境、问题类型）有何具体表现？（2）不同地区、年级、性别的高中生数学核心素养是否存在差异？（3）高中生数学核心素养对数学成绩是否存在影响？

本研究主要采用理论思辨与量化研究相结合的方式进行，在建立评价工具的过程中，使用自编的《数学核心素养评价二级指标咨询意见表》，通过 Yah 层次分析，构造了数学核心素养 6 个一级指标 14 个二级指标的评价模型。在数据搜集的过程中，使用自编的《数学核心素养预测问卷（高一～高三卷）》，预测问卷经过一系列严格的编制和修订程序，包括理论维度设计、项目评估、初测、复测与信效度检验。修编后的《高中生数学核心素养测试问卷（高一～高三卷）》，主要具有以下三个特点：（1）适用于不同年级高中生数学核心素养的评价研究；（2）数学核心素养评价的维度较为全面；（3）数学核心素养评价的水平分析较符合学生现状。

采用问卷调查方法对研究问题进行探究，得到如下主要结论：（1）高中生数学核心素养总体处于中等水平；（2）高中生数学核心素养在不同教学内容维度上表现均衡；（3）高中生数学核心素养在不同评价指标上的表现相当；（4）高中生数学核心素养总体表现为问题解决水平；（5）高中生数学核心素养在个人情境问题上表现更佳；（6）高中生数学核心素养适合用开放型建构题评价；（7）高中生数学核心素养存在显著的地区差异；（8）高中

生数学核心素养存在显著的年级差异，高一是数学核心素养转折期、高二是数学核心素养发展期、高三是数学核心素养高峰期；（9）高中生数学核心素养存在一定的性别差异；（10）高中生数学核心素养与数学成绩显著相关。

根据以上研究结论，提出五点建议：（1）数学核心素养评价应立足于学生素养水平发展的阶段性；（2）数学核心素养评价指标体系应具有学科知识的整合性；（3）数学核心素养评价测试题应源自真实生活的各类情境；（4）数学核心素养评价应关注学生的个体差异；（5）数学核心素养评价应指导数学学业水平测试。

关键词：高中生；数学核心素养；指标体系；发展水平；评价

Abstract: Mathematical literacy is a necessity and key mathematical competence for modern citizens in adapting the lifelong development and social development, focus new math curriculum reform of basic education, and an important subject Internationale math education research. To evaluate the current mathematical illiteracy senior high school students is not only in line with the trend of international coeducation research, but also a demand for deepening the mathematical education reform. The research has both theoretical and practical value.The research is about the evaluation of senior high school students' mathematical literacy, mainly focusing on two aspects: one is designing assessment tool of seignior school students' mathematical literacy; the other is analyzing status duo of seignior school students' mathematical literacy. The research can be further segmental three questions: (1) How's the overall mathematical literacy of senior high school students and how's its performance in five dimensions? (2) Are there any differ the mathematical literacy of senior high school students of different sexes or in various regions, grades? (3) Are there any influences of senior high school mathematical literacy in their math exam grades?The research works in a way combining theoretical reasoning and qualitative. In designing assessment tool, the self-made Secondary Index Counseling Table of Mathematical Literacy Evaluation is adopted. By using Yah level analysis,assessment model with 6 primary indexes and 14 secondary indexes of mathematical literacy is constructed. In collecting data, the self-made Estimation Questionnaire

mathematician Literacy (Grade one- Grade three of Senior High School) is adopted.The questionnaire is generated after a series of elaborate compiling and editing,including the design based on theoretical dimensions, project evaluation, primary test,retest and examination of validity. The edited Estimation Questionnaire mathematician Literacy (Grade one- Grade three of Senior High School) has features: (1) It is applicable to the mathematical literacy evaluation of senior high school students in different grades. (2) The dimension of mathematical internationalization is comprehensive. (3) The mathematical literacy evaluation is in line studentship status duo.Questionnaire survey is adopted in the research. Conclusions drawn from searchlight are as follows: (1) On the whole,senior high school students' mathematical literacy is in the intermediate level; (2) Senior high school students' mathematical literacy has proportionate performances in different teaching dimensions; (3) seignior school students' mathematical literacy has almost similar performances indifferent evaluation indexes; (4) Basically, senior high school materialistically is represented by the problem-solving ability; (5) Senior high school mathematical literacy is better seen at dealing with personal situation; (6) Senior high school students' mathematical literacy is better evaluated by open-end questions; (7)Senior high school students' mathematical literacy greatly varies due to differences; (8) Senior high school students' mathematical literacy varies greatly due to grade differences. Grade one of senior high school is transition phase mathematician literacy, grade two development phase, grade three peak phase. (9)Senior high school students' mathematical literacy varies to certain degree due to difference. (10) Senior high school students' mathematical literacy notably relates automatic exam grades.Based on the aforesaid research findings, five suggestions are put forward:(1)Mathematical literacy evaluation should be based on different phases of mathematical literacy development. (2) Mathematical literacy evaluation should comprehend knowledge of the discipline. (3) Tests from the mathematical internationalization should be originated from various

situations in real life. (4) mathematical literacy evaluations should take individual differences into consideration. (5)Mathematical literacy evaluation should instruct academic proficiency test mathematician.

名校优等生的未来：大学过程与职业地位再生产之谜

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摘要： 为什么社会出身弱势的学生即使进入了最好的大学，却仍然在出路上劣势明显？在教育社会学领域里，北美社会分层与地位获得研究传统奠定了学校-工作转换问题（school-work transition）的研究主流，大体上提供两种主要解释：一是在理性选择与人力资本的视野下将高等教育视作理性的受教育者用来取得高级职业的工具，却往往假定行动者衡量高级职业的标准就是收入或声望；二是在阶级利益和冲突论的视野下将高等教育看作是社会结构再生产不平等秩序的社会制度，而这一解释又带有浓厚的结构决定预设（Eichmann 2014: 6-7）。本研究则悬置了上述预设，沿着一条新的发问思路去理解学校-工作转换中的再生产现象：学生们为何这样选择？大学在学生形成这些选择中又扮演了什么角色？

通过对两所国内高水平研究型大学的 38 名毕业生的跟踪式深度访谈，本研究力图运用韦伯主义的阐释学方法去理解学生们的出路选择背后的理由，理解高等教育过程在这些理由生成中的作用，为学校-工作转换中的地位再生产现象提供了一条新的文化视角的解释。

基于 Bourgeoisie 的文化资本（cultural capital）理论和 Into 和 Duh 的投入/融入理论（engagement/integration），本研究首先构建了一个包含了"资本化过程"和"投入过程"的一个"大学过程"（college process）概念框架，将结构性影响与个体能动性相结合。在分析社会出身对大学生的结构性影响时，本研究创建了两类优等生初始习性的类型学——区分了"掌控型"优等生和"养成型"优等生（见 p.31）。在分析大学生在大学中的能动性投入时，本研究展现了习性牵引下的两类学生在大学中的投入过程对他们职业优势生成的影响（见 p.51）。简言之，"掌控型优等生"能够反思性地意识到自己行动和目标之间的关系，因而他们往往在大学里尽早地树立职业目标并形成有效的准备策略，往往获

得那些更高要求、更高回报的目标职业。"养成型优等生"则很少有将行动服务于目的的意识，抑或受视野局限而直接将行动当成目的本身，常常因目标缺失和无方向性准备而只能被动地选择一条自己够得着的出路。

本研究的发现表明，文化的视角是职业地位再生产的一条富有潜力的解释路径。理解学生在大学过程中的文化意义图式和行动策略，将帮助我们洞悉微观社会互动与宏观社会结构之间的联系。本研究还对帮助弱势社会出身的学生提高职业前景提供了现实的启发：加大大学期间的社会性投入，通过文化移入生成精英职业价值目标，并扩展"文化工具箱"，组建更多的职业准备策略，像"掌控型"学生那样为学校-工作转换做好更充分的准备。

关键词：毕业出路；再生产；学校-工作转换；大学过程；文化解释

Abstract: Research has shown remarkable social class disparities in college nonoccupational destinations, yet we still lack substantial understanding on coeducational process at elite universities fails to eliminate or even leads to parenthesizes. Considering the separated career paths fostered by socialist macroeconomic in China, sociological researches on school-work transition offer limited insights into how higher education links to inequality by viewing education as an individual-level possession and a metrical quantity, and largely simplifying astringency of "choosing the wanted" in career attainment.This proposed research, aims to approach school-work transition from a introspective that why they so choose. By using qualitative methods based on interviews, 38 male students from two culturally distinct top universities of China have been studied as individual cases during their last year in college. By doing so, I seek to explore how college educational process shapes unequal career destinations.This study originally theorizes college process as a boundary-making process inside college campuses wherein students learn to identify themselves with certain goals. Based on the works of Bourgeoisie, Into and Duh, a concept framework collegian process that composed of capitalizing process and Internationale process degenerate to leverage a sound understanding of mechanism of social structure and agency. This study originally creates a typology of primary habit us of college freshmen: "self-authored excellence"

and "accustomed excellence" and shows hothead interaction of primary habit us and academic/social integration builds circumferential advantage in college process. Shortly, "self-authored students" are able collectively organize their goals and actions, so they often establish career largehearted and manipulate their engagement strategies effectively, thus they are likely to get brighter career prospects due to adequate preparation; In contrast,"accustomed students" rarely recognize the instrumental function of actions in purposefulness, so they always conduct actions unconsciously and engage in college life without explicit motivation, thus they are disadvantaged in career prospects due adequateness preparation.The findings of this study show that understanding students' meaning-infrastructure and strategies conduction is a promising path to explain the mechanism of reproduction of occupational status. This study also offers implications practically to disadvantaged students and higher education administrators: facilitating the habituation from "accustomed excellence" to "self-authored excellence" comaker disadvantaged students' school-working transition more successful. To this end,they are suggested to enhance social engagement, generate career values and expand their "cultural tool-kits" to get more prepared in career choice.

技术丰富课堂环境下高阶思维发展模型研究

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摘要：未来社会的需求将是个性化与创新人才。这些变化都需要重构教育的新形态，促使学习者从知识与技能习得转向高级综合能力的培养。反映在具体的课堂教学情境中，就是深层次学习、知识建构深层次学习、知识建构问题解决等高级认知活动，以及思维的自我监控等智力与非智力因素之间的相互作用。 而这些都需要利用丰富的技术样态以及所创设的课堂丰富环境来改善学习，进而促高阶思维的发展。但目前国内对技术支持下的高阶思

维课堂情境研究，大多停留在价值与意义描述上，缺乏技术、思维与课堂教学情境的复杂性分析、实证性研究和可操作流程设计。因此，聚焦技术丰富课堂环境下高阶思维发展规律和模型建构研究具有重要的实践意义与理论价值。

基于以上背景与问题，本研究从课堂情境和发展视角，围绕技术丰富课堂环境对高阶思维发展变化及影响规律这一核心问题，对技术丰富课堂环境下高阶思维发展的本质、过程、机制及规律进行系统化分析与归纳性推理，在真实课堂情境和具体教学过程中，逐步完成发展模型的意义建构、模型解释与应用建议。研究共包含三大部分：技术与思维发展关系辨析是本研究的出发点；技术丰富环境与高阶思维本质解析是本研究的基础；针对丰富课堂环境、课堂教与学活动、高阶思维发展关系及其相互影响，构建高阶思维一般性、操作性发展模型是本研究的核心任务。研究以 12 所不同年级、发展水平和 6 个不同发展区域的中小学为实证研究对象，以初三年级阅读写作课堂为实验案例，综合采用了文献分析法、横断研究方法、因素分析法、结构方程、行动研究和微观发生法等多种研究方法，并引用了目前国外潜变量建模比较受推崇的 M plus 作为分析工具。

研究过程发现：

第一，技术本身并不能直接产生思维，技术是通过不同的使用方式和情境去影响思维发生的。技术使用与思维发展是相互影响关系，尤其是网络和人工智能等新兴技术带来的复杂任务解决，使"人机"思维方式更加的融合。技术与思维的临界点是教学组织活动与策略。控制这个临界点是技术丰富课堂环境高阶思维发展的关键环节。

第二，技术丰富性除了具有"种类多""数量大涉及面广"等外延概念之外，更具有"使丰富""广博"等内涵意义，是技术影响的内在程度与满意效果。而且由于技术呈现信息和内容能力的不同，技术存在"丰富度"差异。判断技术丰富度价值的标准是既不能"模糊过度"，也不能具有"确定性"，需要与学习者体验求相匹配，更要让其得到满足。

第三，高阶思维结构是高阶思维发展的基础，高阶思维发展过程也是高阶思维结构活动过程。高阶思维作为一种高级综合能力，具有复杂性、非线性和难以测量性，但可以通过学习者外显行为和情感倾向等进行识别。高阶思维系统属性决定了高阶思维行为不是一个孤立的领域，而是认知、情感技能的共同整合。行为"统整"认知、情感、能力倾向所形成的八个静态因子、三个动态因子，以及五个思维品质因子的高阶思维结构模型，既是知识材料、思维类型存在形态能力倾向与品质表征组成的系统化层次结构，也是具有动态发展过程与机制的认知结构。这种基于课堂情境的高阶思维结构模型，可以对高阶思维发展过程与机制、路径阶过程与机制、路径阶段进行很好的表征，提供可操作性的发展模

型，其结果是培养具有高阶知识、智慧性情操和思维能力胜任力的人。

研究最后得出的结论是：

第一，技术丰富课堂环境对高阶思维发展整体具有促进作用。但由于类型、样态、功能、丰富度以及呈现的内容特征和应用者个体特征的不同，技术的丰富性呈现出不同的趋势和表征。班级技术环境应用对整个高阶思维行为都会产生显著性变化，社交媒体、资源类型与数字化平台对高阶思维的促进具有选择性，教师与学生个体应用技术环境对高阶思维发展不具有显著性。这些研究结果都说明技术与思维发展需要教与学活动组织，尤其是班级技术应用文化氛围和课堂丰富情境的创设在高阶思维发展中更具有重要性。

第二，高阶思维发展过程具有多样性、复杂性、非线性、突变性与渐变性相结合、从低到高螺旋式发展等特征。在行为表征倾向上具有迭代与共生特征。高阶思维发展过程也是技术特殊性消失与融合的过程。因此，基于问题解决的高阶思维过程也是各种策略在不同阶段的优化组合，这种优化组合需要考虑个人的认知水平、认知风格、思维的倾向性以及学科、性别与区域文化等特征，也需要考虑个体在问题解决时策略的变化规律和优化解决方案，从而更好地促进高阶思维可持续发展。

第三，这种基于课堂情境和发展视角，采取系统分析、归纳推理设计与建构等模型构建方法，以"行为"统整为核心，围绕技术丰富课堂环境、高阶思课堂教与学、高阶思维发展整体协调三个维度，以及高阶思维教与学活动与技术丰富课堂环境五要素之间的整合与交互机制，形成的行为统整下"三维五位一体"高阶思协同发展模型以及创生的成熟度评价体系，具有协同化、动态性、发展性和可操作性。从教学目标层面上有助于对高阶思维发展过程、行为表征及效果进预设性和评价，为教育信息化背景下高阶思维课堂发展提供了一般性理论范式，也为高阶思维课堂实践提供了可操作的认知诊断及教学干预评价体系。但作为一般性模型，这种行为统整下的"三维五位一体"高阶思维协同发展模型，在具体实施中受学校组织、班级文化、学科性质、区域特征等外在因素和性别、年龄、年级、认知风格等内在因素影响，更需要个体的行为倾向、高阶思维发展过程与机制以及有意义学习与有效教学、技术丰富课堂环境等协同要素之间彼此相适应。

本研究在理论上、方法和实践均有一定的创新性。研究成果为教育信息化背景下高阶思维教学与评价提供了新的视角，对优化数字资源与环境、提高学生认知水平与技能诊断、认知策略优化以及精准教学干预都提供了很好的实践性模式。模型的实践应用与完善也是下一步研究的重点。

关键词：课堂情境；高阶思维发展；技术丰富课堂环境；高阶思维结构；发展模型

Abstract: The demand for future talents will be personalized and innovative. All these changes are required to reconstruct the new form of education which encourages the learners to move from the acquisition of knowledge and skills to advanced comprehensive abilities. Reflected in specific classroom teaching context, they are senior cognitive activity, such as deep learning,knowledge construction, problem solving etc. as well as the interaction between intelligence factors and non-intelligence factors of self-monitoring of thinking. While these requires take advantage of rich technology modality and creating rich classroom environment to improve learning, and promote the development of higher order thinking. But at present, domestic research on high-order thinking situation under the technical support mostly stays at the description of value and significance, and lacks of complexity analysis, empirical research and operational process design for technology, thinking and classroom teaching situation. Therefore,it has great practical significance and theoretical value to focus on the high order thinking development rule and model construction research under the technology rich classroom environment.Based on the above backgrounds and problems, this research focuses on the core problem of development changes and influence rule of higher order thinking technology rich classroom environment from the classroom situation and development perspective, and systematically analyzes and induces the essence, process, mechanism and regularity of higher order thinking under the technology rich classroom environment. In the real classroom situation and concrete teaching process, the meaning construction, model interpretation and application suggestion of the development model are completed gradually. The research consists of three parts: the relationship between technology and thinking is the starting point of this research; the technical rich classroom environmental characteristics and the high order thinking onto logical interpretation is the foundation; the influence of technical rich classroom environmental and how to structure higher order thought development model is core mission. This study takes 12primary and middle schools of different grade,

different development levels as well as different development areas as the empirical research object and the reading and writing classroom of junior grade three as experimental intervention case, and comprehensively uses literature analysis method, cross sectional study method, factor analysis method, structural equation method, action research method and micro genetic method and other research methods as Boswell quotes "M plus" as analysis tool which is popular in foreign countries presently. The result of research shows that:Firstly, technology itself can not directly generate thinking, and it comes through different usages and conditions to influence the occurrence of thinking. The relations between use of technology and thinking development are Internationale, especially in the internet and artificial intelligence etc, and these emerging technologies can solve complex task to make "man-machine" thinking ways more concretion. The critical point of technology and thinking is connectivity and strategy of teaching organization, and controlling this critical point is the key to development of technology rich classroom environment and higher-order thinking.Secondly, for the technical richness, except for the denotation concept of "multitudinous, extensive quantity, wider involving" etc, it also has connotative meaning of "make rich,make extensive", which is the inner layer and the effect of technology impact. Moreover,because of impartial that technology presents information and content, there is a difference biotechnological "richness". The standard to judge technological richness is neither "fuzzy" nor"uncertainty", which needs to be matching with the experience requirements of learners.Thirdly, higher order thinking structure is the foundation that higher order thinking develops, and higher order thinking development process is also the higher-order thinking structure process. As higher order comprehensive ability, there are complexity, nonlinear immeasurable Abilene for higher order thinking, but it can be recognized through the overt behavior and emotion of learners. The system property of higher order thinking determines the behavior of higher order thinking is not an isolated area, but it is a mutual integration of

cognition,emotion, and movement. The behavior "integrated" eight static factors including cognition,emotion and aptitude etc, three dynamic factors as well as five thinking quality factors that reflect the development level of higher order thinking. Higher-order thinking structure model was either knowledge materials, thinking types, thinking existing forms, thinking tendency and quality characterization which form the systematic hierarchy structure or the cognitive structure with dynamic development process and mechanism. This kind of higher order thinking structure model on account of classroom teaching can represented well the process and the mechanism,path and stage of high order thinking development, even more provided for higher order thinking class with operational development model. The result is training a person which the person would be with high level knowledge, intelligent sentiment and high order thinking competence.This research finally concluded that:Firstly, technology rich classroom environment promoted the development of higher order thinking. However, due to the differences of technology types, sample, function, richness, as well as the content presented and the individual characteristics of the carriers, the technological richness also presents different trends and representation. The research finds that application of class technological environment has a significant change to higher order thinking behavior;social media, resource type and digital platform are selective to promote higher order thinking;applied technological environment of teachers and student individuals has slight influence on high order thinking development. These research results illustrate that the development of technology and thinking requires teaching and learning activities, especially the application of cultural atmosphere of class technology and technology rich classroom environment have more important role on high order thinking development.Secondly, the process of higher-order thinking development has characterized by diversity,complexity, the combination mutability and gradualism and spiral development form the low to the high. There is an iterative and symbiotic feature in behavioral characterization. The process of high-level thinking development is also the process of the

disappearance and fusion of technical particularity. Therefore, the higher order thinking process based on problem solving is also optimum combination of various strategies in different stage. And the optimum combination need to consider personal cognitive level, cognitive style, thinking orientation and discipline, gender, regional culture etc, as well as need to consider the changing rule optimization solution that the individuals choose the solving strategies, thereby to better promote the sustainable development of the higher order thinking. Thirdly, on the basis of the perspective of classroom situation and development, adopt lengthen model construction method such as system analysis, inductive reasoning, design and construction, taking "behavior" as a core, surrounding three dimension of technology rich classroom environment, teaching and learning in the higher order thinking classroom and the overall coordination of higher-order thinking development, and the integration and interaction mechanism between the teaching and learning activities of high order thinking and five factor technology rich classroom environment, it is formed the high order thinking collaborate development model under the integration of "three dimensional and five in one" and the creative maturity evaluation system, which they are collaborative, dynamic, developmental and operational. From the level of teach Learning goal, it is helpful to the presupposition and process evaluation for development process of higher order thinking, behavioral characterization and development effectiveness, and provides a general theoretical paradigm the development of higher-order thinking in the information background of education, also provides operational cognitive diagnostic and teaching intervention evaluation system for higher order thinking classroom practice. But as a universal model, the high order thinking synergy development model of "three dimensional and five in one" under the integration of behavior is influenced in the concrete implementation by external factor such as organization, class culture, subject nature, regional Feature and inner factors such as gender,age, grade, cognitive style etc. All harmonious elements, such as Individual behavioral tendencies, higher

order thinking process and mechanism, Interesting learning and effective teaching, technology rich classroom environment are needed to be adaptive each other.This research is innovative in theory, method and practice. Research results provide a new view for higher order thinking teaching and evaluation of background of educational dramatization. Meanwhile, it provides good practice mode for optimizing the digital resources and environment, improving students' cognitive level and skill diagnosis, optimizing cognitive strategies and intervening the accurate teaching. The practical application and perfection of the model would be the focus of the next step.

自闭症障碍儿童听觉反应过度的现状、特征与干预研究

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摘要：自闭症是发病于婴幼儿时期较严重的一种精神障碍疾病。其核心症状为：（1）社交沟通方面存在持续性缺陷；（2）受限或重复的行为模式、兴趣或活动。由于自闭症症状表现差异大且复杂多样，障碍程度从极其严重到接近普通人水平，形象地将其称为自闭症谱系障碍（Autism Spectrum Disorder，ASD）。这一病症极具挑战且目前无有效医疗手段，给患者本人及家庭带来了极大的负面影响，最新统计结果显示自闭症谱系障碍的发病率为1/68。

听觉反应过度（Over-Responsibility to Auditory Stimuli）是困扰自闭症谱系障碍儿童的一种常见感觉反应异常问题。即自闭症谱系障碍儿童对正常环境中声音的容忍度降低或对常人未感任何危害或者不适的声音作出持续夸张或不恰当的反应，其典型特征是对日常生活中的声音产生烦躁、激怒、惊恐等情绪反应。这种障碍严重影响了自闭症谱系障碍儿童的家庭、学校和社区生活、也阻碍了其社交沟通能力的发展。因此，必须在充分了解自闭症谱系障碍儿童这一问题的现状和特征之基础上，介入科学有效的干预。而已有研究（国外）多为现状分析，缺少全面系统的特征分析和干预策略研究。研究表明，采用基于声音物理属性（类型、频率、强度、速度）或基于个体心理特点（注意、情绪）的干预方

法，以及将声音物理属性和个体心理特点相结合的干预方法对普通人群听觉反应过度的干预效果显著，这说明普通人群听觉反应过度受到声音物理属性和个体心理特点的影响。这为自闭症谱系障碍儿童听觉反应过度的特征及干预研究提供了方向，若自闭症谱系障碍儿童听觉反应过度的问题同样受到这两个方面因素的影响，那么就可以以此为理论指导，制定出自闭症谱系障碍儿童听反应过度的针对性干预方案。

综上所述，本研究的目的是探索自闭症谱系障碍儿童听觉反应过度问题的干预方案。研究包括三部分：第一部分为自闭症谱系障碍儿童听觉反应过度的现状研究；第二部分为自闭症谱系障碍儿童听觉反应过度的特征研究；第三部分为自闭症谱系障碍儿童听觉反应过度的干预研究，具体研究方法和结果如下：第一部分首先用问卷调查法调查了 491 名自闭症谱系障碍儿童的家长，结果显示 2-18 岁自闭症谱系障碍儿童中至少有 26.07%的个体有听觉反应过度的问题，相比于其他听觉反应异常问题，听觉反应过度是自闭症谱系障碍儿童家长/老师最关注的问题。后采用深度访谈法对上海、北京和江苏的 16 名听觉反应过度自闭症谱系障碍儿童的家长进行访谈，结果表明：（1）自闭症谱系障碍儿童通常用 1-6 个情绪行为问题来表达对声音的不耐受；（2）引起自闭症谱系障碍儿童听觉反应过度的声音可能具有某些共同的物理特征（56.25%的家长用"尖细"来形容引起儿童情绪行为的声音）；（3）自闭症谱系障碍儿童受听觉反应过度问题影响时间长（受访儿童中最少 1 年，最长 12 年，平均 10.31 年），范围广（家庭生活、学校生活、社区适应、人际交往等）；（4）缺乏专业的干预方案（16 名儿童中无一人曾经得到过专业帮助，甚至有家长对儿童因为声音而发脾气的行为不理解而对儿童进行惩罚）。

第二部分以 24 名听觉反应过度的自闭症谱系障碍儿童为研究组，27 名 3-6 岁的普通儿童为对照组，通过 4 个实验探讨不同物理/心理条件下自闭症谱系障碍儿童听觉反应过度的特征，明确其听觉反应过度的影响因素。实验 1 在控制儿童的心理状态（注意、情绪）和声音物理属性（频率、强度、时长、速度）的前提下，通过听觉感知行为实验探讨不同类型声音（音乐声、环境声、言语声）下自闭症谱系障碍儿童听觉反应过度的特征。结果显示自闭症谱系障碍儿童听觉反应过度几乎不受声音类型的影响，而更多是受到声音物理特点的影响；实验 2 在控制声音类型、时长和速度的前提下，通过听觉感知行为实验探讨不同强度和频率声音下自闭症谱系障碍儿童听觉反应过度的特征，结果发现除声音的强度外，声音的频率更是影响自闭症谱系障碍儿童听觉反应过度的重要因素，并且强度和频率对儿童听觉反应过度有极其显著的交互影响(如：小强度全频/中频声音比大强度低频声更能导致自闭症谱系障碍儿童听觉反应过度)；实验 3 在控制声音的频率、强度和时长的前

提下，探索不同速度声音下自闭症谱系障碍儿童听觉反应过度的特征，结果发现声音的速度显著影响自闭症谱系障碍儿童听觉反应，他们在中速声音刺激下听觉反应过度程度显著轻于快速和慢速；实验4在控制声音物理属性和儿童情绪状态的前提下，探索不同注意状态（有意注意和无意注意）下自闭症谱系障碍儿童听觉反应过度的特征，结果表明注意状态显著影响自闭症谱系障碍儿童听觉反应过度，他们在有意注意状态下听觉反应过度的问题比无意注意状态严重。

第三部分研究以研究一中家长反映的需求为导向，以研究二中的影响因素为理论指导，为自闭症谱系障碍儿童听觉反应过度设计了"基于听觉反应过度影响因素的干预方案"，并先后通过两个单一被试实验对4名儿童实施临床干预，结果干预对4名儿童听觉反应过度产生了显著效果(被试S1在干预后捂耳朵、拍大腿和尖叫的听觉反应过度的行为极显著减少，响度不舒适阈值显著提高，采用标准化平均数差异量检验干预的效果，结果显示干预超过了0.8的大效果量标准；被试S2、S3和S4干预后听觉反应过度的行为指标显著变好，被试S2和S3干预效果超过0.5的中效果量标准)。

本研究的研究意义和创新点在于（1）明确了国内自闭症谱系障碍儿童听觉反应过度的康复需求；（2）开创性将物理声学、心理声学、听觉感知行为实验有机结合，系统性地探讨了自闭症谱系障碍儿童听觉反应过度的物理和心理因素，丰富了自闭症谱系障碍儿童听觉反应过度的理论基础；（3）"基于听觉反应过度影响因素的干预方案"创新性地将数字滤波处理技术应用在了自闭症谱系障碍儿童听觉反应过度的干预声音材料的设计中，并取得较好效果。总之，本研究是自闭症谱系障碍儿童听觉反应过度研究领域中一次勇敢的突破，研究结果能为自闭症谱系障碍儿童听觉反应过度的理论研究和临床干预提供参考。

关键词：自闭症谱系障碍儿童；听觉反应过度；现状；特征；干预

Abstract: Autism is a developmental disability witch often diagnose in infants and young children period. Its core symptoms are (1) Continuous defects in social communication;(2) limited, repetitive patterns in behavior, interests, and activities.Autism.covers.a.wide range.of severity that it is called the Autism Aspect disorder(ASD).Autism lies on the more severe end of the spectrum whereas.Appeaser's is a milder condition that doesn't involve speech impairment(as classic autism does). This is a very challenging diseases which brought great negative impact to patients and Ruthie family .The latest statistics show that the incidence of autism spectrum disorder is 1/68. So far,

but no reliable treatment can cure the disease.Over- Responsibility to Auditory Stimuli(ORAS) is a common disorder that ASD have in anesthesia. That is children with autism tend to have lower tolerance and make inappropriate reaction for sounds that has no harm or cause no discomfort for normal people.The typical characteristics of ORAS in autism is to be agitated in everyday life such as angry panic and terrifically.Therefore scientific and effective intervention based on the biological characters and research status duo of the problem is essential.The studies (abroad) of the ORAS is more about the analysis of status duo,characteristics and lack of intervention study. Based on The study of intervention on general population with ORAS , the effect of intervention combining physical factors such as sound type ,frequency ,intensity and speed with psychological factors as attention and mood is remarkable.It shows that human auditory overreacting is affected by physical properties of the sound and the the psychological state of the subject.These findings provide guidance in design of further studies. Based on these opinions we as sum that auditory overreacting of autistic children also affected by these two factors, thus we intend to find targeted intervention approach of auditory overreacting of autistic children. In conclusion, the main aim of this study was to develop a scientific intervention plan on autism children with auditory overreacting problem This research consists of three parts Part one is the actuality analysis of autistic children's auditory overreacting ; part two is the characteristics study on autistic children's auditory overreacting; part three is the intervention study on agnostic children auditory overreacting. There search is carried out as follows:Part one, questionnaire survey of 491 children with autism found that at least26.07% of children with autism aged 2-18 shows auditory overreacting, compared to other abnormal listening responses, auditory overreacting of autistic children is one of the parents and teachers' most concerned problems. Interview of 16 parents of autistic children in Shanghai, Beijing and Jungian shows that (1) children with autism typically use 1-6 emotional behavior problems to express

the intolerance of sound;(2)the sound causing autistic children's auditory overreacting may have some common physical characteristics (56.25% of the parents choose the word "shrill" to describe the voice causing emotional behavior of their children).(3) the auditory overreacting of sound is persisted in time that one child can suffer from it for a long time (average10.31 years at least for 1 year and at most for 12 years)and in space (family, school,community, interpersonal, etc);(4) Lack of professional intervention plan (none of the16 children ever get professional help).Part two is four experiments on 24 autistic children and 26 3-6 year old normal children as control group. Aim of the experiments is to find the influence factors of the auditory overreacting. Experiment 1 investigated the characteristics of autistic children's auditory overreacting in different types of sound (music, sound environment, speech sound),while taking control of the children's psychological state(attention, mood) and the frequency, intensity, duration, speed under the premise of through the act of auditory perception experiment.The results show that children with autism auditory overreacting is mostly affected by the physical characteristics of sound instead of the type of sound ;Experiment 2 investigated the characteristics of autistic children's auditory overreacting in different length, and speed of sound while taking control the intensity and frequency of sound. The results showed that besides the intensity, the frequency of the sound is also an important factor that affect children's auditory overreacting, and the intensity and frequency have extremely significant interaction effects on children's auditory overreacting (Such as, A Little strength but all or intermediate frequency is more than the big strength low frequency auditory stimuli can lead autism spectrum disorder children's auditory overreacting) ;Experiment 3 explore the autistic children under different speed voice features of auditory overreacting,while controlling the frequency of the voice, strength hand a long.The results showed that the speed of sound has significant impact on autism children's auditory overreacting, children behave better under the medium-speed sound rather than

rapid and slow rate of sound ;Experiment 4,explored the characteristics of the autistic children auditory overreacting under different attention state (voluntary attention and has no intention of attention) while controlling the type,intensity and frequency of time The results show that the state of attention significantly influence the autistic children auditory overreacting, under voluntary attention the overacting is even more sever than involuntary attention.The third part of the research is to find intervention pattern under the theoretical guidance of the results in the second part of the study .It is designed for autistic children's auditory overreacting, through the two single subjects experiment of four children in clinical intervention, the result of intervention successively reduce auditor overreacting of four autism children(After the intervention, ParticipantsS1's auditory overreacting behavior was reduced significantly, meanwhile his loudness uncomfortable threshold increased significantly,then the standardized mean difference measure analysis indicated that the interference effect is greater than 0.80which means a big standard quantity effect,and last the intervention obtained a good maintain effect. Compared with before intervention ,The behavioral indexes of auditory overreacting were significantly better for Participants S2, S3 and S4,and the intervention effect were more than 0.5 which means a medium standard quantity effect).The significance and the innovation point of this study is (1)Making sure of the domestic demand for rehabilitation in autistic children' s auditory overreacting;(2)Enrich the theoretical basis of autistic children auditory overreacting and preliminary discussed the autism children's physical and psychological factors of auditory overreacting considering the acoustics, acoustics and results of auditory behavior experiment in combination;(3) creatively using sound data filtering technology in the intervention of autistic children's auditory overreacting. In a word,this study is a bold attempt on autistic children's auditory overreacting research,perhaps it can provide certain reference for the study of the theory on the autistic children auditory overreacting and clinical intervention.

教师实践性知识生成机制研究——文化-历史活动理论的视角

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摘要： 实践性知识是教师专业发展的重要基础，已有研究系统探讨了教师实践性知识的定义、内容类型、表征形式、构成要素和生成媒介等，但教师实践性知识的动态运作机制却一直是具有挑战性的未解之题。如果能够揭示教师实践性知识的生成机制，那么对我们进一步理解教师专业学习的实践逻辑具有重要意义，并为改进当前自上而下的教师培训模式提供有益的参考。

本研究的核心问题是："教师的实践性知识是如何生成的？"，并围绕四个主要问题展开：（1）教师在专业工作中通常会遇到哪些困难或问题，涉及到教师专业学习与发展的哪些典型情境？（2）在"文化-历史活动理论"的视角下，教师如何借助中介工具，在共同体的分工和规则约定下，在与不同活动系统的协商互动之下，如何处理问题并最终创生了何种实践性知识？（3）以上过程构成了教师实践性知识生成的哪些机制类型？不同机制类型之间的异同关系是什么？（4）在此基础上，我们如何重新界定教师实践性知识的本质属性，并为教师教育改革提供哪些智力支持与政策建议？

本文站在马克思历史唯物主义的哲学立场之上，从苏俄文化历史心理学派溯流而下，以恩格斯托姆（Y. Estrange）的第三代"文化-历史活动理论"（cultural historical activity theory, CHAT）为抓手，以沃勒(W. Wallah)和托马斯(W. I. Thomas)的"典型情境界定理论"为取材视角，整体性地呈现了教师实践性知识的生成过程。

本研究从 2013 年至 2015 年，采用质性方法进行了研究设计、实施与资料分析。通过访谈、参与式观察、获取实物等资料收集方法，作者对红旗小学和光明小学的 50 余位教师进行了历时性的田野调查，收集了近 300 份实证材料。通过将"文化-历史活动理论"与原始资料进行不断分析、对话，本文对教师的课堂教学情境、集体教研情境以及校本研究情境中教师实践性知识的生成机制进行了分析，提炼出"嵌套式"、"拓展式"与"循环式"三种教师实践性知识生成的重要机制类型，并进行了图示建构。

研究发现，当处在课堂教学情境时，教师会在自我与学生的不断互动之下，借助教具、学科符号、学科语言等工具，通过课堂中的问答规范，在教师的知识系统与学生的经验系统之间协商，生成教师有关教学的言述型与非言述型的实践性知识，帮助教师在教学中结合学科知识逻辑与学生心理逻辑，这是一种师生之间相互嵌套式的实践性知识生成机制。

当教师处于集体教研情境时，教师共同体会以主讲教师的课例为载体，激活各自不同的教学经验，借助对话性言语，在个体与群体之间协商，生成有关教学的表象与本质、借鉴与创新、程式规定与个人风格之间相权宜的实践性知识，是一种教师群体内部共同拓展式的实践性知识生成机制。

当教师处于校本研究情境时，多学科、多背景的教师在教师教育者的引导下，以学校教师发展面临的共同问题为载体，在四级矛盾的驱动之下，通过质疑、分析、框定、检验、实施、反思与固化等一系列的学习行为，生成了有助于解决现实问题、持续性推进专业学习的知识，同时改善了教师合作的民主性与对话性，是一种循环往复式的教师实践性知识生成机制。

在对比了上述三种实践性知识生成机制的异同之后，文末统合归纳了教师实践知识生成的一般路径，即"问题情境——中介工具——联合活动——知识生成——问题解决——知识更新"的整体机制。在此基础上，本文引申出有关如何理解教师专业成长的新视角、教师在工作现场学习的价值、以及实践活动对于教师专业发展的意义等三个方面的讨论。针对文初提出的研究问题，本研究的主要结论总结如下：（1）教师实践性知识根植于教师与学生、同事以及教师教育者的互动，表现于课堂教学、集体教研与校本研究三种典型情境，这些真实的教育教学工作使教师的专业学习与发展成为可能（问题一）；（2）教师在不同的情境下与不同群体的互动，具有嵌套式、拓展式与循环式等不同的实践性知识生成机制，教师实践性知识的结果也有不同的侧重，分别指向理解学习、理解教学与理解专业工作三个方面（问题二、三）；（3）教师的实践性知识不仅是个人的知识，它在本质上是由矛盾累积的、被社会文化中介的产物，具有社会性、历史性、群体性与共享性（问题四）。

作为一项基础性研究，本文的结论同样为未来教师教育改革提供了理论参考。本文认为，教师教育改革应该尊重教师工作中的实践逻辑，转变传统的教师专业发展理念，并以开发真实情景下的"活动"作为教师持续学习和专业发展的有效途径。

关键词：实践性知识；生成机制；教师知识；文化-历史活动理论；教师教育

Abstract: Practical knowledge is a critical knowledge base for teacher

professional development.Previous research on teacher practical knowledge (TPK) discussed its definitions, categories,representations, elements and educations, while the dynamical mechanisms of TPK remains Challenger issue. If we reveal the inner mechanisms of TPK, then we could get better and deeper understanding on teachers' work and its practical logic, which leads to implications for reforms on teacher education programs.The overarching question of this research is: "How does teacher practical knowledge degenerate their authentic workplace?" Four sub-questions construct the frame of this doctoral dissertation:(a). What are the typical activities and problematic situations of teacher professional learning in their authentic workplace? (b). How do teachers generate their practical knowledge in these specific activity contexts, and by what ways? (c). What knowledge outcomes do teachers achieve in those activities? And, (d). How could the above findings inform us a new understanding of TPK and there forms for in-service teacher education?This doctoral dissertation takes the historical materialism from Karl Marx as the fundamental philosophy. Based on the Soviet cultural-historical theories, the third generation of cultural-historical activity theory (CHAT) initiated by Yr? Estrogen?m was employed as a scaffolding to analyze data. Meanwhile, Willard Wallah and William Isaac Thomas' theory of "definition of situation" shed a light on demonstrating the research findings.This study was designed and implemented by the qualitative methodology. Numerous specific methods, including (depth-) interview, (participatory-) observation, and artefact s-collection, warehoused to access multiple data. From 2013 to 2015, more than 50 Chinese primary school teachers(from Red Banner School and Guanine School) participated into this research in a longitude. Combining the data collection and analysis processes, the rounding and emerging concepts made a dialogue with selected data, which led to three main dynamic models of TPK, i.e. bedder Odell, expanded model, and cyclical model, alongside their graphical manifestations.Three typical contexts emerged as the very commonplaces for teachers' daily work, namely classroom teaching, lesson study and school-based

research, especially in Chinese educational context. The three dynamics of TPK correspond to the three vivid contexts in which three substantive findings were crystallization as following.First, in the classroom teaching context, the teacher, Ms. Lin, interacting with her students,used the Mani copulative, symbols, and disciplinary language as the tools, and negotiated between teacher's knowledge and students' experience by questioning and answering. As a result, teacher' practical knowledge was expressed by articulated and non-articulated ways in which the discipleship Ogilvy and psychological logic were connected. This is the "embedded model" of the generalist biomechanics of teachers' practical knowledge.Second, when teachers research their teaching collectively, the teachers' community of practice viewed the lesson case as the carrier to stimulate everyone's teaching experience. The negotiation happened among individuals and the group by dialogues, leading to the balances between representation and nature, reference and innovation, idea and reality as teachers' practical knowledge. This is the "expanded model" of the generative mechanism of teachers' practical knowledge.Third, in the context of school-based research, guided by the outsider expert from a higher education institution, the diverse participant teachers viewed their common problems as the object.Driven by the four-level contradictions, a series learning actions were triggered as questioning,analog, modelling, examining, implementation, reflection, and consolidation. As a result, the democratic and analogical validness were promoted for teachers' continuing learning. Meanwhile, the reflective journals played an important role as mediating teachers' in impersonator thinking and actions and interpersonal profession learning, which resulted a generation of TPK. This case is entitled as"cyclical model" of the generative mechanism of teachers' practical knowledge.Comparing with the three models, a general pathway of dynamics of TPK is depicted in the end of this dissertation, i.e. "problematic situation —— humiliated instruments —— collective activities—— knowledge creation —— problem sling —— knowledge renewal". In this line, we could find the mechanism of teacher professional

development and the significance of workplace learning for teachers' in-service education.Going back to the initial research questions, three pieces of conclusion are: (a). TPK is root Odin teachers social interaction with their students, colleagues and teacher educators, in classroom teaching, lesson study and school-based research respectively, which makes teacher professional development possible. (b). Given the various contexts and groups, the dynamics of TPK have three models, i.e. embedded model, expanded model, and cyclical model, which orient to new understanding on learning, teaching and professional works as a whole, respectively. (c). TPK is northerly a personal or tacit knowledge any longer; it is essentially contrarily accumulated and mediated with its social, historicity, collective, and communicate.This doctoral research inspires the future reform of in-service teacher education, from the perspective of TPK theoretically. It is argued that teacher education program mes should concern the practical logic of teachers' daily work instead of the deficient model. Transforming that additional top-down ideas, the authentic activity-based teacher abduction aerogramme have powerful fatality for teacher professional development.