

The Data Analysis of Primary and Secondary School Teachers' Educational Technology Training Result in Baotou City of Inner Mongolia Autonomous Region

Wang Li

Inner Mongolia normal university, china
ciectl@imnu.edu.cn

Abstract

The national primary and secondary school teachers education technology ability training aims to improve primary and secondary school teachers education technology ability, and promote the professional development of teacher. The sample of this study comes from 2010 to 2012 primary and secondary school teachers education technical ability test data in Baotou city of Inner Mongolia autonomous region. In this paper, using statistical analysis, interviews and other research methods, then in-depth analysis the influencing factors of education technical ability training effect, It can provide some references to carry out the education technology training and the new curriculum reform for the whole autonomous region.

Keywords: *education technology, One-Way ANOVA analysis, T-test, suggestion*

1. Research Background

In order to improve the primary and secondary school teachers education technology ability, and promoting teachers' professional development, to adapt to the full implementation of quality education and basic education curriculum reform demands. On December 25, 2004, the ministry of education issued the primary and secondary school teachers education technology ability standard (try out), In accordance with the requirements, the ministry of education to implement the national primary and secondary school teachers education technology ability training plan in April 2005. This plan base on the primary and secondary school teachers education technology ability standard (try out), and the aims to nationwide set up teachers' education technology training, examination and certification system. to achieve revolutionary change of institutional level and education system as soon as possible all provinces (area) according to the actual situation in the region carry out the primary and secondary school teachers' education technology training and proficiency test [1]. The training in the Inner Mongolia autonomous region since September 2008, As of December 2012, there were 180000 people to participate in training teachers in the region. The basic completed the training objectives of primary level.

Teachers training and examination of the Inner Mongolia autonomous region is divided into five parts, they are divided into "basic knowledge", "teaching plan", "source surveillance". Teaching implementation", "teaching evaluation", after in the four part is the typical work tasks of teachers. In the process of training, the training base of subject teaching as the main object, strictly in accordance with the typical basic teaching links in the process of teaching organization to carry out the training. meanwhile, the content of examination in line with training content, With the purpose of inspection to attend training of teachers how master basic knowledge and education technology application ability in education technology.

In a remote area of Inner Mongolia, the place of teachers' education technology is relatively backward. About primary and secondary school teachers' education technology ability of primary level, it has played a vital role for primary and secondary school teachers' professional development in Inner Mongolia. The Inner Mongolia autonomous region a total of 12 leagues and cities, among them, Baotou city has 9 counties, and it has 603 primary and secondary schools, has 23863 staffs, including 17305 full-time teachers. House of audio-visual education programme training base of Baotou city undertake the work that is for the city's primary and secondary school teachers in the education technical ability training, However, high school teachers (including higher professional education teacher) of education technical ability training by Baotou Teachers' College training base. The Inner Mongolia autonomous region training test paper exam is guided by the ministry of education exam outline, testing process is strictly in accordance with requirements of the outline of subject classification, test content, test method, etc. We will be using the method of multivariate statistical analysis analyses test data of training effect in Baotou city of Inner Mongolia autonomous region and find out the factors affecting the training effects, It can provide some references to carry out the education technology training and the new curriculum reform for the whole autonomous region.

2. The Research Object and Methods

The sample of this study comes from 2010 to 2012 education technical ability test data in Baotou city of Inner Mongolia autonomous region, it is a total of 9170, and to eliminate abnormal data(For example by using the examinee to fill in the ID number of computing the teachers age was 30 years old, However, if the use of teachers engaged in teaching time calculation teaching experience for 18 years, so the teacher from 12 years old started to teach, which data is obviously wrong.) and duplicate data, the actual effective sample data is 7826. The test is online to answer questions, before testing, examinees must fill in some basic information that their ID number, gender, education, teaching time, work unit and so on, until the end of the exam, we enter them and test scores into the database. In these test data, we use SPSS software to carry on the analysis, find out the factors that affect the examinee exam results.

According to the statistical analysis results, the information that training base, instructors, attend training teachers that are from different subjects, different ages, whose knew some information about the class and grade composition and students attendance, subject teachers' basic information as well as the problems existing in the training process , We carried on the detailed interviews. Classifying interview arrangement and analysis, To understand related factors affecting the effects of teachers' education technical ability training, Further, the conclusion of validation statistics analysis, it can make the research conclusion more scientific.

3. The Data Analysis Process

The author to sorting and statistical data in a test, it is concluded that the mean and standard deviation of the variable. Using regression analysis in SPSS software enables data to successive regression inherent law, It is concluded that the main factors influencing the test result is teaching experience, subject, and gender., The teaching experience and the subject adopts One-Way ANOVA analysis, Gender use independent-sample T Test analysis, in order to further determine the interactional relationship between them [2].

3.1 The Teaching Experience Adopts One-Way ANOVA Analysis

We use classification and counting analysis for teaching experience, at the same time, we set up teaching age difference is five years for teachers [3]. The basic statistics as shown in The first chart.

According to statistics data, the frontline teachers' experience are mainly concentrated in between six to twenty-five years, With the increase of teaching experience, the test result in reduced and there is an obvious negative correlation between teaching experience and test result, how the knowledge of education technology master, short of teaching time teachers have an advantage over long of teaching time teachers.

The First Chart is the Basic Statistics of Teaching Experience Factor the Dependent Variables is Test Total Points

Teaching Experience	N	Mean	Std. Deviation	Std. Error
<=5	1157	86.67	10.163	0.299
6-10	1477	84.36	10.734	0.279
11-15	1490	83.99	11.074	0.287
16-20	1263	83.67	11.779	0.331
21-25	1149	82.73	12.364	0.365
26-30	742	82.53	12.498	0.459
>=31	548	80.91	14.090	0.602
Total	7826	83.87	11.662	0.132

The second chart is the result of one-way analysis of variance for teaching experience. In the second chart, “*” means that in each teaching experience period of statistical results significant difference at 0.05 level [4]. It can be seen from the second chart, every ten years' experience as a stage, it is divided into two groups, the teaching experience for a group of more than 10 years and a group of less than 10 years. results significant difference between two groups, the teaching experience is more than 10 years that there is no significant difference in groups, But in the teaching experience group of less than 10 years, it is significant that teaching experience is less than 5 years and between 6 to 10 years of teachers in test scores.

The Second Chart is the Result of One-way ANOVA for Teaching Experience the Dependent Variables is Test Total Points

I-J	6-10	11-15	16-20	21-25	26-30	>=31
<=5	2.306*	2.682*	2.997*	3.942*	4.144*	5.763*
6-10		0.375	0.691	1.636*	1.838*	3.457*
11-15			0.316	1.261	1.463	3.081*
16-20				0.945	1.147	2.766*
21-25					0.202	1.821
26-30						1.619

“*” The mean difference is significant at the .05 level

3.2 Primary School of Disciplinary Adopts One-Way ANOVA Analysis

According to the classifying sample data of primary and secondary schools, then, primary school teachers' information are extracted from the data. meanwhile, We found

that the sample data is inconsistent information, for example, when the candidates filled in the basic information, their work unit should be fill in XXX primary school, however, They filled in for an examination subject code is T201, T201 as subject code is set test content for high school Chinese teacher. There was an obvious mistake this information, so we delete these errors sample data, we finally get the number of valid sample data is 2644 people. After statistical analysis carried out in accordance with the subject variables, they get primary school subject factors basic statistics, as shown in the third chart.

The Third Chart is Primary School Subject Factors Basic Statistics the Dependent Variables is Test Total Points

Subject	N	Mean	Std. Deviation	Std. Error
Eglish	210	85.22	10.692	0.738
Matsh	683	83.09	12.259	0.469
Chinese	1236	81.07	12.417	0.353
PE	166	79.14	15.353	1.192
IT	39	78.14	10.849	1.737
Music	127	77.20	11.623	1.031
ART	110	75.00	11.980	1.142
Ideology and morality education	32	73.58	11.675	2.064
Natral and science	41	71.82	13.070	2.041
Total	2644	81.08	12.643	0.246

As can be seen from the subject factors in the basic statistics, to participate in the test are majority in English, mathematics, Chinese subject teachers. English teachers' education technology test scores are significantly higher than other subjects, And natural science and ideology and morality teacher education technique ability to master is obviously lower than other subjects

As shown in the fourth chart, the result of one-way analysis of variance for teaching for primary school subject. As can be seen from this chart, English, mathematics, Chinese teachers test results significant differences with other subject teachers', and the difference is statistically significance.

The Fourth Chart is the Result of One-way ANOVA for Primary School Subjects the Dependent Variables is Test Total Points

I-J	Matsh	Chinese	PE	IT	Musi c	ART	Ideolog y and moralit y educati on	Natral and science
Eglish	2.137	4.155*	6.082*	7.083*	8.023*	10.224*	11.646*	13.407*
Matsh		2.019*	3.946	4.946	5.886*	8.087*	9.509*	11.270*
Chinese			1.927	2.927	3.868*	6.068*	7.490*	9.251*
PE				1.001	1.941	4.142	5.563	7.324
IT					0.940	3.141	4.563	6.324
Music						2.201	3.623	5.384
ART							1.422	3.183
Ideology and morality								1.761

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“**” The mean difference is significant at the .05 level

3.3 One-Way ANOVA Analysis for the Middle School Subjects

According to the classifying sample data of primary and secondary schools, then, to extracted middle school teachers' information from the data, There was an obvious mistake this information, so we delete these errors sample data, We finally get the number of valid sample data is 3995 people. In accordance with discipline variables, we can use one-way analysis of variance analysis the valid sample data, we get the result of basic analysis from the fifth chart, we get the result of one-way analysis of variance from the sixth chart.

The Fifth Chart is the Basic Statistics of the Middle School Subjects the Dependent Variables is Test Total Points

Subject	N	Mean	Std. Deviation	Std. Error
Chemistry	251	89.546	7.8666	0.4965
Eglish	566	89.193	8.7306	0.3670
Chinese	888	87.873	10.2220	0.3430
History	204	87.855	7.7512	0.5427
Geography	157	86.280	8.3362	0.6653
Matsh	697	86.214	9.0570	0.3431
PE	209	84.282	11.0166	0.7620
Biology	217	82.675	11.1412	0.7563
IT	133	82.541	12.3959	1.0749
physics	272	81.184	10.9138	0.6617
Music	93	80.995	10.0009	1.0371
Political	229	80.838	11.0143	0.7278
ART	79	74.823	10.4939	1.1807
Total	3995	85.887	10.2957	0.1629

The Sixth Chart is the Result of One-way ANOVA for the Middle School Subjects the Dependent Variables is Test Total Points

I-J	Eglish	Chinese	History	Geography	Matsh	PE	Biology	IT	physics	Music	Political	ART
Chemistry	0.35	1.67	1.69	3.27*	3.33*	5.26*	6.87*	7.00*	8.36*	8.55*	8.71*	14.7*
Eglish		1.32	1.34	2.91*	2.98*	4.91*	6.52*	6.65*	8.00*	8.20*	8.35*	14.4*
Chinese			0.02	1.59	1.66*	3.59*	5.20*	5.33*	6.69*	6.88*	7.03*	13.0*
History				1.58	1.64	3.57*	5.18*	5.31*	6.67*	6.86*	7.02*	13.0*
Geography					0.07	2.00	3.61*	3.74	5.10*	5.29*	5.44*	11.5*
Matsh						1.93	3.54*	3.67	5.03*	5.22*	5.38*	11.4*
PE							1.61	1.74	3.10	3.29	3.44	9.46*
Biology								0.13	1.49	1.68	1.84	7.85*
IT									1.36	1.55	1.70	7.72*
physics										0.19	0.35	6.36*
Music											0.16	6.17*
Political												6.02*

“**” The mean difference is significant at the .05 level

From the fifth and sixth charts, we can know that participate in the education technology are majority in English, mathematics, Chinese subject teachers, and the chemistry teacher education technique ability is superior to other courses of the teacher, the art subjects teacher education technique ability significantly lower than the other subjects, According to the fifth chart and sixth chart each subject teacher is roughly can be divided into four groups, they are chemistry, English, Chinese, history. And geography, math. PE, biology, IT, physics, music, politics and Art. The results significant difference between two groups, but there is no significant difference in the group.

3.4 Gender Factors use Independent-sample T Test Analysis

We first extract the gender of the variables in the sample data, and then according to the gender independent sample T test, the results are shown in the seventh chart and the eighth chart. Can be seen from the two charts, male teachers are 2382, and female teachers are 5444. The result of F is Sig=0.000, it is less than 0.01, this shows that Equal variances not assumed, from the eighth chart, we know, T test Sig (bilateral) = 0.000, less than 0.01, Men's and women's teacher education technique ability significant difference in statistical sense. Women teachers' performance is better than that of male teachers as a whole.

The Seventh Chart is Gender Factors Basic Statistics the Dependent Variables is Test Total Points

total points	gender	N	Mean	Std. Deviation	Std. Error
	Male	2382	82.10	12.246	0.251
	Female	5444	84.64	11.311	0.153

The Eighth Chart is the Data of Gender Factors use Independent-sample T Test Analysis the Dependent Variables is Test Total Points

		The result of F		T Test of Mean				
		F	Sig	t	df	Sig (2-tailed)	Mean Difference	Std. Error Difference
total points	Equal variances assumed	14.530	0.000	-8.921	7824	0.000	-2.543	0.285
	Equal variances not assumed			-8.648	4232.401	0.000	-2.543	0.294

4. Conclusion and Suggestion

As the result of data analysis shown, In such aspects as teaching experience, discipline, gender, teachers who participate in the training test scores have obvious difference. We combined with the interview and the project group members draw the conclusion of investigation and analysis about in Inner Mongolia Ordos city primary and secondary school teacher education technology training effectiveness. And then for further analysis and give some Suggestions for training

4.1 Different Disciplines Divided into Different Classes, Teachers of Different Ages to Match into Learning Group

According to the statistical data of primary and secondary school subjects and teaching age, it is also exist obvious differences for different age and the teaching experience of primary and secondary school teachers on the degree of education technology ability.

Meanwhile, the author also has interviewed many users to know that Baotou city facing the whole country recruiting primary and secondary school teachers, young teachers, especially middle school teachers in education background, discipline background, teachers' professional capacity, or from the modern teaching means such as pedagogy, psychology and computer applications have significantly improved than before in recent years. Young teachers' classroom teaching under the information technology environment with high ability [5]. For English teachers, due to the high professional level English course requirements, therefore, English teachers in education technology ability is better than the other subjects. In daily teaching process is often used in some of the subjects of modern education technology teachers these subjects such as chemistry, history, Chinese and so on, and that their education technique ability is better also. Through communication with schools, to teach nature, moral character teachers who are older age or unable to take other courses teaching task, and trainers also reflect this part of the teachers to accept knowledge is also very difficult. Therefore, it is recommended that the training base in subject to divide into classes, When trainers are in the grouping teaching, They try to arrange in the old, middle-aged and young teachers match within a learning group, a good study team, such not only can play their respective advantages and learn from each other, but also conducive to promoting the effect of training. After this, training base of trainers can accord to the different subject teachers different to the degree of grasp of education technology to arrange teaching contents and progress.

4.2 To Ensure Class Hour, to Ensure that the Trained Teacher Participation is a basic Requirement to Ensure the Training effect

Through consultation with training base, communication with the speaker teachers, we extract the part of the training teachers' attendance, assignments, presentations, group activities. In the training process, we found women teachers' participation in the training process is far greater than the male teachers'. However gender statistics results show that women teachers master of the education technology ability is better than male teachers. This demonstrates that the participation in the process of teachers' training significantly effect on test scores. Therefore, it is recommended that the training institutions in the assessment of teachers' training is qualified, not only should based on the test scores, but also should have the final assessment result is divided into two parts, namely consists of average grades and test scores, average grades and test scores account for certain proportion average grades is composed of the training teachers' attendance, and assignments, presentations, group activities, according to the training teachers' participation, they can get corresponding average grades. We adopt such evaluation mode, it can improve the participation of training teachers, and increase the enthusiasm of receives training teachers, so as to ensure the training effect.

4.3 Choose the Right Instructor, Make the Training Content Modular

In training Most of the teachers think that training content separated itself from the classroom of primary and secondary schools, it paid attention to theory, to overlooked practice, and it lacked of case teaching. Therefore, it is recommended that training base shall do a good job to select the instructors carefully, instructors should have the following requirements: (1) Teachers should be familiar with the learning of primary and secondary school classroom. (2) Teachers should know education technology and information technology. (3) The teacher of According to the discipline divide into classes teacher should be very familiar with the teaching of the content of the subject. (4) Teachers should have rich experience in practice training. Only in this way, teachers can competent primary and secondary school education technical ability training work, they can accomplish a task with ease and do not separated itself from the classroom of primary and secondary schools.

In addition, the content of design should be modular, throughout, different subjects choose different teaching cases. According to the primary and secondary school teachers education technology ability level exam outline requirements, make the training content modular. For example, it can be divided into “the education technology”, “the collecting and sorting informationization teaching resources”, “teaching design, select teaching media and practice teaching”, “teaching evaluation”, and so on [6]. Among them, “the education technology” module is the common knowledge of all disciplines to teach. The rest of the various modules, choose the corresponding to different disciplines to a knowledge point of case teaching in the subject. It should choose the same knowledge points, and use it throughout from “the collecting and sorting the informationization teaching resources” module to “the teaching evaluation” module.

4.4 Construction of Network Training Learning Platform for Follow-up Study

Data statistic analysis shown that training effect is closely linked daily teaching is often used in the process of modern education technology. Therefore, as if the training base have financial ability, it is recommended that the training base set up network learning platform, provide guarantee for training and continue to learn. Through the network learning platform, subject teachers can through the network learning platform to study education and technology in their spare time. Teachers can also exchange experiences with each other on the platform, training institutions can regularly provide online answer and guidance for subject teachers. Through the network learning platform to provide rich learning resources and application case, made the learning of the education technology normalization. Rather than assemble for training for a few days, you can get a certificate after the training. Through long-term study, each subject teachers education technology ability have improved, naturally, it will be applied into the daily teaching process, so if it much more used in the daily teaching process, teachers test scores will improve, furthermore this way promote the training effect, at last, it can forming a virtuous circle.

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Authors



Wang Li, obtained Bachelor’s Degree of Engineering from Inner Mongolia University of Technology in 2004, and obtained Master’s Degree of Science from Inner Mongolia normal university in 2014. She is currently researching on Data mining.