Identifications of Skills Required by High School Teachers & Students to Apply ICT
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Abstract
The Purpose of this Research was to Identification teachers and students skills require to uses of information and communication technologies. Research method was descriptive from the view of data gathering and it was practical according to goal. Statistical population included all 8097 teachers and 95789 high school students in Tehran city. According to the "Morgan Tables", determined 370 teachers and 384 students as Samples and Chosen them by cluster and Stratified Random Sampling method. The research Instrument for Data gathering was a researcher Designed Questionnaire that contains 38 substances in 7 Degree Scale. A use was made of expert's consensus to evaluate their validity, and a use was also made of Cronbach's alpha to establish the reliability of instruments use in the study and the Result was 0.80. A use was made of SPSS software to analyze data at descriptive and inferential levels by K_S, t test, and ANOVA. Results have shown that for teachers and students, four clusters skills are necessary that the uses them information and communication technologies; technical, cognition, attitude, and communicational skills.

Keywords: Information & Communication Technologies, Technical, Cognition, Attitude, and Communicational Skills;

1. Introduction
Education system which had focused on students’ information transmission and learning increase in previous long term, is looking for modern speed, accuracy, proficiency, communication, information and technologies in 21th century educational areas. In this areas, classroom, as a public and school self service is named knowledge republic which follows special standards require high attention in application (Torkamandi, 1389). Investigation of information and statistics of information technology spread in world countries education system shows that there is a comprehensive program to outfit schools with some facilities like computer and Internet in many developed and under developed countries (Jalali & Abbassi, 1382). The importance of ICT application in teaching and learning process and its impression on learning improvement through simulation possibility, training network, learning by computer, virtual lab & workshops, research groups, computer and Internet workgroup, network search and lesson plan and evaluation has been implied in different researches, Ryan, (1991); Barron (1999); Akpan & Andre, (2000); Ellis (2001); Block & Ostam, (2002); Waxman (2003). Experience of countries all over the world shows that
educational innovation and evolution is impossible without teachers and students admission. Teacher as the most important principle and reference in education and training organization will not be able to do the duties properly without knowing complexity of global evolutions and necessary skills and knowledge. Thus, in recent millennium, professional capability of teachers increases in learning and teaching process through ICT application (i.e. collection, organizing, storing and emission of information such as voice, image, text or number) (Turban & et al, 2005, quoted by Sharifi & Eslamieh, 1388).

Many researchers have been done about applying technology in education. Soleimanpour & et al (1389) have shown that teaching method based on ICT affects on students’ constant learning in empirical science at school. Alberini (2005) showed that teachers had positive sight into applying ICT in training. Teachers view toward technology, experience of technology application and dominated cultural conditions affected on their sight into ICT at schools.

Regarding to mentioned above, not only teachers applying technology in teaching are more interactive than their colleagues but also are more risky and follow their students’ constant learning (Glazer & Hannafin, 2008). If teachers don’t experience ICT in their classes, it won’t be possible to train new generation of teachers who can apply these tools efficiently (Resta, 2002). In fact, most researchers attribute breakage of technology innovation to teachers’ disability in their teaching method modulation in order to maximize potential abilities of such innovations (Cuban, 1986). On the other hand, researches reveal that applying ICT gives a chance of innovation domination and self direction to students. In fact, a teacher by changing his/her role from a transmitter to simplifier can simplify learner (Eslamieh, 1390). Such role requires capable and skillful teachers in teaching school subjects and applying ICT to achieve necessary skills in order to apply ICT in learning – teaching process and making it more attractive and employs more students’ senses by applying ICT in teaching process. Thus, recent study looks for skills required by teachers and students to apply ICT. Six following questions are considered to achieve mentioned purpose:

1. How much do teachers and students need technical skills to apply ICT?
2. How much do teachers and students need cognitive skills to apply ICT?
3. How much do teachers and students need attitude skills to apply ICT?
4. How much do teachers and students need communication skills to apply ICT?
5. Is there difference between teachers’ realization of required skills to apply ICT from the view of gender?

2. Methodology

This research is survey method. Statistics population is all teachers and students of Tehran high schools (11545 teachers & 166852 students). Sample is 370 teachers and 384 students who were first selected by multi steps cluster sampling and then by simple stratified random sampling. Data gathering is by researcher made questionnaire included 38 clauses. Questionnaire validity from the view of form, structure and content is confirmed by experts and a primary study has been done on 30 persons of statistics population to determine validity and validity coefficient of questionnaire calculated through Alpha coefficient is 0.80. Data analysis is divided into two levels, descriptive and inferential. K_S experiment is applied to determine data scattering, one-group t experiment, two independent groups t experiment and variance analyses are applied to examine hypothesis in inferential level.

3. Findings

Question1. How much do teachers and students need technical skills to apply ICT?

Since calculated t with degrees of freedom 369 and 383 for two tailed experiments in level 0.05, (4/83 & 4/73) is higher than t critical amount (1/96), (table1), so null hypothesis based on there is no difference among observed means and population mean (4) is rejected and therefore there is a significant difference between observed means and population mean and it is said by 95% significance that teachers and students need technical skills to apply ICT.

<table>
<thead>
<tr>
<th>Component</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>t</th>
<th>df</th>
<th>Sig(2-tailed)</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers</td>
<td>370</td>
<td>4.83</td>
<td>1</td>
<td>15.64</td>
<td>369</td>
<td>.000</td>
<td>.830</td>
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</table>
Question 2. How much do teachers and students need cognitive skills to apply ICT?

Since calculated $t$ with degrees of freedom 369 and 383 for two ranges experiments in level 0.05 is higher than $t$ critical amount (1/96), (table2), so null hypothesis based on there is no difference among observed means (4/62 & 4/55) and population mean (4) is rejected and therefore there is a significant difference between observed means and population mean and it is said by 95% significance that teachers and students need cognitive skills to apply ICT.

<table>
<thead>
<tr>
<th>Component</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>t</th>
<th>df</th>
<th>Sig(2-tailed)</th>
<th>Mean Difference</th>
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</thead>
<tbody>
<tr>
<td>Teachers</td>
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<td>4.62</td>
<td>.919</td>
<td>13.16</td>
<td>369</td>
<td>.000</td>
<td>.629</td>
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<tr>
<td>Students</td>
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<td>4.55</td>
<td>1.20</td>
<td>9</td>
<td>383</td>
<td>.000</td>
<td>.553</td>
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</tbody>
</table>

Question 3. How much do teachers and students need attitude skills to apply ICT?

Since calculated $t$ with degrees of freedom 369 and 383 for two ranges experiments in level 0.05 is higher than $t$ critical amount (1/96), (table3), so null hypothesis based on there is no difference among observed means (4/74 & 4/85) and population mean (4) is rejected and therefore there is a significant difference between observed means and population mean and it is said by 95% significance that teachers and students need attitude skills to apply ICT.

<table>
<thead>
<tr>
<th>Component</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>t</th>
<th>df</th>
<th>Sig(2-tailed)</th>
<th>Mean Difference</th>
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<td>1</td>
<td>13.96</td>
<td>369</td>
<td>.000</td>
<td>.744</td>
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<td>Students</td>
<td>384</td>
<td>4.85</td>
<td>.91</td>
<td>18.30</td>
<td>383</td>
<td>.000</td>
<td>.854</td>
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</tbody>
</table>

Question 4. How much do teachers and students need communication skills to apply ICT?

Since calculated $t$ with degrees of freedom 369 and 383 for two ranges experiments in level 0.05 is higher than $t$ critical amount (1/96), (table4), so null hypothesis based on there is no difference among observed means (4/56 & 4/63) and population mean (4) is rejected and therefore there is a significant difference between observed means and population mean and it is said by 95% significance that teachers and students need communication skills to apply ICT.

<table>
<thead>
<tr>
<th>Component</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>t</th>
<th>df</th>
<th>Sig(2-tailed)</th>
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<tr>
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<td>4.63</td>
<td>.94</td>
<td>13.2</td>
<td>383</td>
<td>.000</td>
<td>.639</td>
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</table>

Question 5. Is there any significant difference between teachers’ realization of required skills to apply ICT from the view of gender?

Since calculated $t$ of four elements with degree of freedom 368 in significant level 0.05 to compare scores mean is lower than $t$ critical amount, (table 5), so null hypothesis based on there is no difference among subjects’ scores is accepted and therefore there is no significant difference among subjects’ ideas about skills required to apply ICT from the view of gender.

<table>
<thead>
<tr>
<th>Component</th>
<th>Sex</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Levene's Test</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
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</thead>
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<td>4.70</td>
<td>.96</td>
<td>1.417 .235</td>
<td>-1.387</td>
<td>368</td>
<td>.774</td>
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<td></td>
<td>Man</td>
<td>150</td>
<td>5</td>
<td>1</td>
<td>.030 .862</td>
<td>-3.08</td>
<td>368</td>
<td>.758</td>
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<tr>
<td>Cognition</td>
<td>Woman</td>
<td>220</td>
<td>4.61</td>
<td>.91</td>
<td>.030 .862</td>
<td>-3.08</td>
<td>368</td>
<td>.758</td>
</tr>
<tr>
<td></td>
<td>Man</td>
<td>150</td>
<td>4.64</td>
<td>.92</td>
<td>.135 .713</td>
<td>.288</td>
<td>368</td>
<td>.154</td>
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<tr>
<td>Attitude</td>
<td>Woman</td>
<td>220</td>
<td>4.87</td>
<td>1</td>
<td>.135 .713</td>
<td>.288</td>
<td>368</td>
<td>.154</td>
</tr>
<tr>
<td></td>
<td>Man</td>
<td>150</td>
<td>4.54</td>
<td>1</td>
<td>.256 .613</td>
<td>-.878</td>
<td>368</td>
<td>.380</td>
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<tr>
<td>Communicational</td>
<td>Woman</td>
<td>220</td>
<td>4.51</td>
<td>1</td>
<td>.256 .613</td>
<td>-.878</td>
<td>368</td>
<td>.380</td>
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<tr>
<td></td>
<td>Man</td>
<td>150</td>
<td>4.60</td>
<td>.97</td>
<td>.256 .613</td>
<td>-.878</td>
<td>368</td>
<td>.380</td>
</tr>
</tbody>
</table>
4. Discussion and conclusion

Results related to first question of research showed that teachers and students need technical skills to apply ICT. Nowadays, human being meets his/her technical needs contingent with up to dated technologies highly and imagine today world in a way that he/she is a pioneer in all parts specially applying modern technology machines technical and professional skills. Stytle (1387) believes that personnel’s skills development in all aspects especially technical aspect should be considered. In this case we can apply all capacities of technology in teaching and learning. Meanwhile, we should increase their sights and perception about electronic soft wares, internet and other advantages. According to previous researches about internet training abilities, internet as a training tool at school can be applied by suitable arrangement and planning. Thus, most school teachers especially high school ones, have mentioned internet as one of the important requirements necessary to be learnt at school (Islami, 1382). While Labisher (2000) said that most scientific board members of universities have considered internet so necessary to join in internet network to do researches and quoted that they are not willing to work at a university without internet facilities. Recent finding is similar to Nouh Ibrahim & Mohtadi (1387) and Martinez & et al (2000) that showed that structural and technical problems such as lack of suitable soft wares, technical skill weaknesses of people, lack of suitable hard wares are barriers which put applying ICT in trouble.

Results related to second question of research showed that teachers and students require cognitive skills to apply ICT. Increasing observations show that training plans of cognitive skills are so effective on students learning progress. Since most skills like educational, class, sentimental, social and risk taking skills are applied during such training plans. Researches done previously reveal that cognitive skills make training effective in applying ICT and not only cause innovation but also increase constant learning by concentrating on students (Yang Ji, 2002; quoted by Sharifi, 1383).

Results related to third question of research showed that teachers and students need attitude skills to apply ICT. People believe and views toward different topics make their future and their country future afterwards. In third millennium, teachers and students need to abandon their previous believes, concepts and views, learn how to be relax with others, work with others to achieve a common goal. According to wide spread studies related to ICT role in flexible learning plans at schools, ICT can be considered as a reference for teachers who are looking for flexible learning (Hirosate & Tiene, 2001). Researches on principal, teachers and students of 21st classrooms in 16 countries all over the world from 1992 to 1998, have shown that while students started applying ICT, they can do complicated tasks like problem analysis, self-evaluation and planning suitable questions. Students apply new strategies to get along with their friends, their learning includes motivation and they are self-defended enough to do tasks (Kozema, 2002). Thus, Hirosate & Tiene (2001) consider supporting of education and inventors’ strategy especially in application and boosting of ICT and training teachers to apply them at classes of under developed countries as the main challenge of governments. Above result is contingent with other results like Abdollahi (1386) research that has shown that teachers and students believe ICT affects on their knowledge, view changes and also their skills in schedule presentation so much. Alberini (2005) showed that more than 73% of Syrian high school English teachers are familiar with computer and multiple skills and most of them are positive sighted toward applying ICT in education and training system. Lowen (1993) showed that there is a significant relation between scientific board members’ skills of north Illinois university and their views toward applying computer.

Results related to forth question of research showed that teachers and students need communication skills to apply ICT. Communication skill and its indicators are considered as one of the most urgent skill of teachers, students and generally a citizen in different reports. UNESCO considered four principles for human learning during his/her life in 1993: how to know, learn to do, learn living with each other and learn how to be (Rraouf & Faghihi, 1375). Applying ICT in teaching – learning by teachers and students, who know communication skills, helps two sides to be familiar with rules and criterion in electronic area and choose suitable media to connect to each other. They can
also find their favorite virtual areas and not only connect to them but also transfer information and investigate each other points of views (Burckhardt, 2004).

Results showed that there is no significant difference among subjects’ ideas about skills required to apply ICT from the view of gender. According to previous research, knowing and applying ICT by students affects on their educational achievements and deeps learning on them (Hajj Foroush & Aorangi, 1383). But apart from complexity of technology, lack of proficiency, knowledge and positive view toward ICT, makes it impossible to be applied (Baylor & Ritchie, 2002). Above result is contingent with other results like Zal Zadeh (1389), has shown that there is a significant relation between applying ICT and teaching background; and also Adib (1382) have shown that there is a significant difference between students’ view from the view point of communication skills.

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