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Job Satisfaction among Academic Staff in a Faculty of a Reputable Turkish University: Past and Present

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Abstract

This paper examines the change of the determinants of job satisfaction and the commitment among the academic staff between the years 2002 and 2014, in a faculty of a distinguished Turkish university in different age, gender, and positional tenure groups. A questionnaire was filled in by 35 academic staff in 2002 and by 39 academic staff in 2014. The analyses of two different time survey data revealed that positional tenure, age, gender, compensation, and marital status have different effects during the 12 years period of time. Concerning the job characteristics, job level is important for increasing the continuation commitment of academic staff. The females are more committed than males.

Key words: Job satisfaction, Turkey, Academic staff, Job commitment

Introduction

This study is the first to examine the changes in job satisfaction and job commitment over a period of time in Turkish academia. The academia should be able to appeal successful people with academic curiosity. Furthermore, job commitment should be gained. Consequently, knowing the change of the determinants of job satisfaction and job commitment is essential. There are numerous factors that affect job satisfaction in academia. Money plays an important role, but it is not the only parameter. The level of fulfillment of employee's financial and social expectations both determine the level of job satisfaction. There were some studies about job satisfaction among the academic staff in the literature (Iiacqua et al. 1995; Oshagbemi 2003; August & Waltman 2004; Horton 2006; Seifert & Umbach 2008; Love et al. 2010; Mamiseishvili & Rosser 2010; Bozeman & Gaughan 2011; Bentley et al. 2013a; Teichler 2014). Bos et.al. (2009) investigated differences in work characteristics and determinants of job satisfaction among employees in different age groups. Lacy & Sheenan (1997) examined the aspects of academic staff's job satisfaction across the eight nations. Results indicated that factors related to whole academics work environment being the dominant predictor of job satisfaction; morale, sense of community and relationship with the colleagues are the major parameters of job satisfaction. Enders & Teichler (1997) analyzed findings of an international survey on the various subgroups of academics in some of the European countries. The research was focused on the working conditions and how the academics handle their professional tasks. Several works on the subject are recently reviewed by Bentley et al. (2013b). Machado-Taylora et al. (2014 and 2016) reports the academic career satisfaction in Portugal and gender differences with respect to academic job satisfaction. Heijstra et al. (2015) examined whether age, work-related, and family-related predictors explain differences in the academic advancement of women and men in Iceland. Saner & Eyupoglu (2012 and 2013) examined the age, gender and marital status on job satisfaction relationship of academics in North Cyprus where the residents are mostly Turkish origin. Tiwari (2015) studied the job satisfaction of faculty members of selected private universities of Rajasthan state in India . Mirah et al. (2016) investigated the impact of talent management, organizational commitment, job satisfaction and job performance on enhancing job performance at universities in Kingdom of Saudi Arabia universities located in Jeddah.

The factors that influence academic performance are relative. In developing countries knowledge is often held in higher respect and academics benefit from relatively more social status quo, but this is often stabilized by low salaries, poor research facilities, poor physical educational amenities, and lack of intellectual freedom (Altbach 2003). Smeenk et al. (2006) examines the factors of commitment among Dutch university employees in two

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faculties with different academic identities. Their study reveals that social involvement has a significantly negative impact on commitment of academics.

For the academic staff, the university's reputation and standing in community is an important factor for academic job satisfaction. Beyond the economic satisfaction, social status quo is another key reason for motivation. Research and education environment, laboratories, and organizational setting play an important role. Also, collaboration with international researchers is very desirable. Every professor wants bright and talented students in their class. Working with bright students can be a joy and highly rewarding. A good salary is regarded as one of the most important factor to motivate employees, especially in developing countries. A higher level of pay satisfaction can motivate employees to work harder and increase their commitment. Not everything is depend on money in academia, however provided with a minimum required level of wage is essential. Benefits, such as on campus housing and pk-12 schools for the children are also very striking. The future possibilities and expectations are other important factors for academic job satisfaction, it suggests that the position has the potential to fulfill ones future plans. Someone do not need to worry about job satisfaction, if less-competitive criteria for academic promotions are utilized. According to Demerouti et al. (2001) when high job demands are experienced, emotional exhaustion increases and job satisfaction will decrease. Friendly organization motivates academics towards a great job satisfaction. The academic's authority to make decisions freely regarding the tasks is also an important aspect of job satisfaction. Nowadays, reducing expenditures and growing universities, academic employees have an increased teaching load which often delayed at the cost of valuable research time. Because new assistant professors, post-doc researchers, and research fellows with PhDs generally have considerable research time, it might be that they feel privileged to do their work, leading to stronger feelings of organizational commitment.

The target of this work is to investigate the job satisfaction changes in 12 years time among the academic staff of the same faculty in different age, gender, and positional tenure groups. A questionnaire was distributed and filled in by 35 academic staff of the same faculty in 2002. 12 years later, the same questionnaire was again distributed and filled in by 39 academic staff of the same faculty in 2014. The analyses of two different time survey data reveal that positional tenure, age, gender, compensation, and marital status, have different effects during the 12 years period of time.

Working Conditions and Job Satisfaction

The Council of Higher Education is responsible for the supervision of (both public and private foundation) universities in Turkey in accordance with the Turkish Constitution and the Higher Education Laws. Obviously the rector of a university and the dean of a faculty have certain effects on the academic identity of a university or a faculty, whilst, according to the findings of Smeenk et al. (2006), Turkey is grouped as a low-managerialism country for the public universities. In the low-managerial view, the academic identity is considered consistent and uncompetitive, almost no financial reward. The goals are the achievement of knowledge, freedom of thought, and working with colleagues in a proper environment. In Turkey, public university academics have a large number of competing roles such as teaching, research, scientific publication, seeking funding, and conference and seminar commitments. The system is forcing the academics to seek for external funds and other resources. Also a good cooperative research relations with the industry has some positive effects for the academic promotions. For the last decade, the academics who want to get promote on, he/she should publish numerous papers in per reviewed indexed journals, attend conferences, do research projects besides the teaching work, which is 3 to 5 courses per year average. Writing and publishing a manuscript whose language is English is a very meticulous process for the ones whose native language is not English. Generally the language part takes the half of the process, and almost every review the main objection from the reviewers are about the usage of the English language. Besides, every academic staff have some sort of administrative duties.

The academic profession is one of the desirable occupations among the highly educated intellectuals in Turkey, like almost same at the other parts of the world. Among the typical tensions of academics in Turkey are the teaching load, obligation of requirements of scientific and industrial research, mentoring the MSc and PhD students, having administrative duties, difficulties come from financial difficulties such as rents, mortgage payments, credit payments, children's private school tuitions, etc. and dealing with children's education issues related to planning their educational future path.

As an outsider perspective, the academia seems very attractive and easy going environment, on the contrary the academic work is very complex. It is the interaction of both teaching and scientific research with the aid of academic curiosity. One expects for a stable balance between teaching and research. There is also a possibility

of an administrative duty. Theoretically, academics are independent professionals. For the last decade, job security has risen, young academics have to wait for a very long time until they eventually gain secure employment after completing their PhDs. Furthermore, chances to get promoted the influential positions in well respected universities within the academia have seriously weakened. In Turkey, the full professors and associate professors have tenure, and assistant professors practically hold an unlimited contract (renew every 2 years) in public universities. Although, in private universities, all the academics have limited contracts. That is why, for the last five years, the young professors retired early when they completed their required work years (generally, the retirement age in public sector in Turkey is around 50-55 years of age, after completing a minimum 25 years of work), then they continue their university careers in private universities. Generally they double their wages in the private university plus their retirement pension salary. In Turkey's public university system, the employee's pay based on his/her job classification, academic title, and years of working. In this system, the pay is composed of a fixed amount based on job classification, academic title and years of working. There is no flexible part based on job performance as seen in some other countries (Zheng et al. 2014).

In Table 1 the average gross annual salaries in USD for the academic staff is given. The foreign exchange rates are taken from the Central Bank of the Republic of Turkey (CBRT 2014). For a comparison, average annual salaries of full-time public university faculty members in US is given in Table 2. In Turkish public universities, the salary of a newly appointed professor is in between a professor and an assoc. professor for 3 years. In Table 3 the comparison of the ratio of academic staff annual salaries to country's GDP per capita is given. In US the professors have an average salary of 2.29 times the GDP per capita. In Turkey the professors have an average salary of 3.75 times the GDP per capita.

Table 1. Average salaries of the academic staff in public university faculty members in Turkey.

Position	**2002 salary (USD/year)**	**2014 salary (USD/year)**	**Diff. %**
Professor (3+ years)	14044	37920	170.0
Professor (0-3 years)	12267	33577	173.7
Assoc. Professor	10489	29143	177.8
Assist. Professor	8978	24286	170.5
Lecturer	6667	22971	244.6
Research Assistant (RA)	6222	18783	201.9

Table 2. Average salaries of full-time public university faculty members in US. The data are taken from The Chronicle of Higher Education (2001) and (2013).

Position	**2001 salary (USD/year)**	**2013 salary (USD/year)**	**Diff. %**
Professor	84007	123393	46.9
Assoc. Professor	60571	84275	46.9
Assist. Professor	50635	73212	39.1
Lecturer	39928	54382	44.6
Instructor	35210	48359	36.2

As given in Table 3, in the US, the average ratio of annual salaries to GDP per capita is improved 5.1% from 1.55 to 1.63 in 2013, compared to 2002. But in Turkey, the average ratio of annual salaries to GDP per capita is reduced by 5% in 2014 compared to 2002. Also, the ratio of salaries of assist. professors, assoc. professors and professors to GDP per capita are reduced by 9% in 2014 compared to 2002. The GDP data are taken from World Bank (2014).

Table 3. The ratio of academic staff annual salaries to GDP per capita in US and in Turkey.

Position	**US salary/GDP per capita 2002**	**US salary/GDP per capita 2013**	**TR salary/GDP per capita 2002**	**TR salary/GDP per capita 2014**
Professor (3+ years)	2.20	2.38	3.93	3.56
Professor (0-3 years)	2.20	2.38	3.43	3.15
Assoc. Professor	1.59	1.63	2.93	2.73
Assist. Professor	1.33	1.41	2.51	2.28
Lecturer	1.05	1.05	1.86	2.15
Instructor/RA	0.92	0.93	1.74	1.76
Average	1.55	1.63	2.73	2.60

Method

The type of survey used is longitudinal survey. It is used to gather information over a period of time or from one point in time up to another. The aim of longitudinal surveys is to collect data and examine the changes in the data gathered. The participants were the academic staff from a well reputable faculty of a Turkish university in different age, gender, and positional tenure groups. In 2002, the number of participants were 35, and in 2014, the number of participants were 39. They all had the Turkish nationality and had been employed for at least 1 year. All of the respondents returned the questionnaire. All questions had been filled in by all the respondents. The questionnaire contained six questions.

Table 4. Personal characteristics for the academic staff.

	2002 Faculty	**2002 respondents**	**2014 Faculty**	**2014 respondents**
Gender (Male)	79.6%	82.9%	80.30%	76.9%
Gender (Female)	20.4%	17.1%	19.70%	23.1%
Age (Mean)		38.6		39.8
Age (Median)		38		40
Marital Status (Single)	27.8%	71.4%	39.39%	61.5%
Marital Status (Married)	70.4%	25.7%	57.58%	35.9%
Marital Status (Divorced)	1.9%	2.9%	3.03%	2.6%
Academic Degree (BSc)	11.1%	2.9%	21.21%	5.1%
Academic Degree (MSc)	20.4%	28.6%	22.73%	30.8%
Academic Degree (PhD)	68.5%	68.6%	56.06%	64.1%

In 2002 the average age of participants was 38.6 years, median age was 38 (*SD* = 8.77; range 25–65). Of the 35 participants, 17.1% (*n* = 6) were women. Regarding marital status, 71.4% of participants were married, 2.9% were divorced, and 25.7% were single. In terms of their education levels, 68.6% of participants had obtained doctoral degrees, 28.6% had master's degrees, and 2.9% had bachelor's degrees. In 2014 the average age of participants was 39.8 years, median age was 40 (*SD* = 11.31; range 25–62). Of the 39 participants, 23.1% (*n* = 9) were women. Regarding marital status, 61.5% of participants were married, 2.6% were divorced, and 35.9% were single. In terms of their education levels, 64.1% of participants had obtained doctoral degrees, 30.8% had master's degrees, and 5.1% had bachelor's degrees. The personal characteristics for the academic staff and the participants in 2002 and 2014 are given in Table 4.

The well reputable faculty considered here has a distinctive inbreeding history. Due to the fact that the faculty was the only institution in its particular field, inbreeding was inevitable. The author has every confidence in Medawar (1976), about inbreeding in reputable institutions as he mentioned in his famous work *Advice to A Young Scientist*. In 2002 academic staff list, 1 academics has a BSc degree and 16 academics have their PhD degrees from another University, 53 academics have their BSc degrees and 17 academics have their PhD degrees from their faculty. In 2014 academic staff list, 12 academics have BSc degrees and 13 academics have their PhD degrees from another University, 57 have their BSc degrees and 24 academics have their PhD degrees from their faculty. The reason for the rise in the BSc number is that, two other faculties established at the same field for the last decade and their graduates started their graduate level education in the considered faculty.
Comparing the academics in 2002 and 2014; 34 people who were in the 2002 academic staff list are still in the academic staff list of 2014. Most have new academic titles and positions. The remaining 20 people; 4 were retired, 4 deceased, 6 are now in another faculty or university, 6 were working in the industry (left the academic career). In 2002 there were 54 people in the academic staff list in the faculty: 10 Full Professors, 15 Assoc. Professors, 8 Assist. Professors, 1 lecturer with Ph.D., and 20 Research Assistants (2 have Ph.D, 11 have MSc, and 7 have BSc degrees). 17 academics obtained their Ph.D's from the same faculty, and 16 academics obtained their Ph.D's from the leading universities in USA (5), Great Britain (9), Germany (2), and Turkey (1). In 2014 there were 68 people in the academic staff list in the faculty: 16 Professors, 6 Assoc. Professors, 9 Assist. Professors, 8 lecturer with Ph.D., and 27 Research Assistants (1 has Ph.D, 20 have MSc, and 6 have BSc degrees). 24 academics obtained their Ph.D's from the same faculty, and 13 academics obtained their Ph.D's from the leading universities in USA (4), Great Britain (6), Germany (2), and Turkey (1).

Analysis

The questionnaire is consisted of six questions. Questions 1 to 4 have four multiple choices in which the respondents were asked to select the best possible answer. In Table 5, the multiple choice questions are given. Questions 5 and 6 are rating and ranking questions. The respondents were asked to identify the most important

and the second important to them personally. The first given decision strongly favor the first choice over the others, and the second decision slightly favor the second choice over the rest. The purpose is to determine the levels of importance. Rating and ranking questions in 2014 questionnaire are given in Table 6.

Table 5. Multiple choice questions in the questionnaire.

	a	**b**	**c**	**d**
How satisfied are you with your current economic condition?	Perfectly satisfied	Moderately satisfied	Moderately dissatisfied	Totally disillusioned
How satisfied are you with your current social status quo?	Perfectly satisfied	Moderately satisfied	Moderately dissatisfied	Totally disillusioned
How satisfied are you with your current occupation?	Perfectly satisfied	Moderately satisfied	Moderately dissatisfied	Totally disillusioned
How did you choose your profession?	Personal decision	Influenced by family and friends	Influence from outsiders	By coincidence

Being economically satisfied is essential for one's job satisfaction and happiness. Higher job satisfaction grow up to earn higher levels of income. The first question is "In the existing economic situation, how satisfied are you with your current economic condition?" The results are given in Table 7.

Table 6. Decision making and rating and ranking questions in the 2014 questionnaire.

	a	**b**	**c**	**d**
If you win 1 million USD from lottery, what will you do?	I continue my current job situation	I quit my job and start a new life in Turkey	I quit and immigrate to another country	Other (Please specify)
If you win 200,000 USD from lottery, what will you do?	I continue my current job situation	I quit my job and start a new life in Turkey	I quit and immigrate to another country	Other (Please specify)

Table 7. Satisfaction with current economic condition.

	2002				**2014**			
	a	**b**	**c**	**d**	**a**	**b**	**c**	**d**
All respondents	11.4%	20.0%	57.1%	11.4%	12.8%	46.2%	38.5%	2.6%
Male	10.3%	17.2%	58.6%	13.8%	10.0%	46.7%	40.0%	3.3%
Female	16.7%	33.3%	50.0%	0.0%	22.2%	44.4%	33.3%	0.0%
PhD (24-25)	16.7%	16.7%	54.2%	12.5%	8.0%	44.0%	48.0%	0.0%
MSc-BSc (11-14)	0.0%	27.3%	63.6%	9.1%	21.4%	50.0%	21.4%	7.1%
Married (25-25)	16.0%	20.0%	52.0%	12.0%	8.0%	48.0%	44.0%	0.0%
Single (10-14)	0.0%	20.0%	70.0%	10.0%	21.4%	42.9%	28.6%	7.1%

In 2002, 57.1% of all the respondents are moderately dissatisfied with their economic condition, although in 2014 this choice chose by 38.5% of all the respondents. In 2002, 31.4% of all the respondents are perfectly and moderately satisfied; while in 2014 59% of all the respondents are perfectly and moderately satisfied. In 2002, one third of the PhD holders perfectly and moderately satisfied, in 2014 half of the PhD holders perfectly and moderately satisfied with their current economic condition. In 2002, three quarters of the MSc-BSc holders moderately dissatisfied and totally disillusioned with their current economic condition; in 2014 it is vice versa. In 2002, the married were happier with their current economic condition compared to singles; in 2014 it is nearly same. The MSc-BSc holders and singles are further pleased with their current economic condition in 2014, this is due to the fact that younger generation in academics could possibly have lesser financial problems; they have no responsibility for a family, no concerns about children's education, probably staying with the parents or on campus housing (on campus housing is possible for the research assistants since 2007). Also the increase in Lecturer and Research Assistant salaries are much more compared to the professor counterparts, 244.6% and 201.4% respectively.

The second question is "How satisfied are you with your current social status quo?" The results are given in Table 8. In 2002, almost half of all the respondents are perfectly and moderately satisfied with their social status quo, although in 2014 this choice chose by 61.5% of all the respondents. The social status quo condition is improved. While the PhD holders' choice both in 2002 and 2014 not changed so far (54.3% and 56% respectively), the MSc-BSc holders and singles are further pleased with their social status quo increased from 45.5% in 2002 to 71.4% in 2014, this is due to the fact that younger generation in academics dealing with the

social media much more compared to older ones. They express themselves boldly, and have much more self confidence compared to older academics.

Academics have a psychological need to maintain stability in their lives, they are much more motivated if their social status quo condition is higher. In 2002, comparing the married and singles, the social status quo condition almost the same, whilst in 2014, married academics are perfectly and moderately satisfied by 52.1% and singles by 75% with their social status quo.

Table 8. Satisfaction with the social status quo.

	2002				2014			
	a	**b**	**c**	**d**	**a**	**b**	**c**	**d**
All respondents	11.4%	40.0%	40.0%	8.6%	12.8%	48.7%	30.8%	7.7%
Male	10.3%	41.4%	41.4%	6.9%	10.0%	50.0%	30.0%	10.0%
Female	16.7%	33.3%	33.3%	16.7%	22.2%	44.4%	33.3%	0.0%
PhD (24-25)	12.5%	41.7%	37.5%	8.3%	12.0%	44.0%	32.0%	12.0%
MSc-BSc (11-14)	9.1%	36.4%	45.5%	9.1%	14.3%	57.1%	28.6%	0.0%
Married (25-25)	12.0%	40.0%	40.0%	8.0%	13.0%	39.1%	34.8%	13.0%
Single (10-14)	10.0%	40.0%	40.0%	10.0%	12.5%	62.5%	25.0%	0.0%

The third question is “How satisfied from your occupation?” This is a very direct question, the results are given in Table 9. In 2002, almost three quarters of all the respondents are perfectly and moderately satisfied with the academic world, while in 2014 this choice chose by 92.3% of all the respondents, and no respondent is totally disillusioned. The job satisfaction of married ones is in general higher than single counter parts in 2002, but there is no difference in 2014. Married academics perfectly and moderately satisfied with their jobs 86% in 2002 and 91.6% in 2014. Although single academics completely and moderately satisfied with their jobs 70% in 2002 and 93.3% in 2014.

Table 9. Satisfaction with current occupation.

	2002				2014			
	a	**b**	**c**	**d**	**a**	**b**	**c**	**d**
All respondents	57.1%	17.1%	20.0%	5.7%	71.8%	20.5%	7.7%	0.0%
Male	58.6%	17.2%	20.7%	3.4%	70.0%	23.3%	6.7%	0.0%
Female	50.0%	16.7%	16.7%	16.7%	77.8%	11.1%	11.1%	0.0%
PhD (24-25)	54.2%	20.8%	16.7%	8.3%	68.0%	24.0%	8.0%	0.0%
MSc-BSc (11-14)	63.6%	9.1%	27.3%	0.0%	78.6%	14.3%	7.1%	0.0%
Married (25-25)	56.0%	20.0%	20.0%	4.0%	70.8%	20.8%	8.3%	0.0%
Single (10-14)	60.0%	10.0%	20.0%	10.0%	73.3%	20.0%	6.7%	0.0%

The fourth question is “How did you choose your profession?” The results are given in Table 10. In 2002 20%, and in 2014 10% of the respondents chose “by coincidence”. It is the belief that someone's kismet and fate is pre-determined and unchangeable, it should be accepted because it ultimately cannot be avoided (Burrus and Roese, 2006). It is expected that the intellectual level is getting higher, the kismet and fate belief is getting lower. In this geography kismet and fate belief has a great effect on people. In 2002 and 2014, the MSc-BSc holders and singles are choosing “personal decision” 100% and 93% respectively. Singles are assumed to know what they want compared to married ones, both in 2002 and 2014.

Table 10. How did you choose your profession?

	2002				2014			
	a	**b**	**c**	**d**	**a**	**b**	**c**	**d**
All respondents	77.1%	2.9%	0.0%	20.0%	79.5%	7.7%	2.6%	10.3%
Male	72.4%	3.4%	0.0%	24.1%	80.0%	6.7%	3.3%	10.0%
Female	100.0%	0.0%	0.0%	0.0%	77.8%	11.1%	0.0%	11.1%
PhD (24-25)	66.7%	4.2%	0.0%	29.2%	72.0%	12.0%	4.0%	12.0%
MSc-BSc (11-14)	100.0%	0.0%	0.0%	0.0%	92.9%	0.0%	0.0%	7.1%
Married (25-25)	68.0%	4.0%	0.0%	28.0%	70.8%	12.5%	4.2%	12.5%
Single (10-14)	100.0%	0.0%	0.0%	0.0%	93.3%	0.0%	0.0%	6.7%

Table 11. If you win 500 000 (2002)/1 Million (2014) USD from lottery, what will you do in the first choice?

	2002				2014			
	a	**b**	**c**	**d**	**a**	**b**	**c**	**d**
All respondents	62.9%	22.9%	11.4%	2.9%	64.1%	15.4%	17.9%	2.6%
Male	65.5%	17.2%	13.8%	3.4%	66.7%	13.3%	20.0%	0.0%
Female	50.0%	50.0%	0.0%	0.0%	55.6%	22.2%	11.1%	11.1%
PhD (24-25)	58.3%	20.8%	16.7%	4.2%	76.0%	16.0%	8.0%	0.0%
MSc-BSc (11-14)	72.7%	27.3%	0.0%	0.0%	46.2%	15.4%	38.5%	0.0%
Married (25-25)	60.0%	20.0%	16.0%	4.0%	79.2%	12.5%	8.3%	0.0%
Single (10-14)	70.0%	30.0%	0.0%	0.0%	40.0%	20.0%	33.3%	6.7%

In the questionnaire, for the questions 5 and 6, the money win from lottery in 2002 was 500,000 USD and 100,000 USD respectively; and the money win from lottery in 2014 was 1 Million USD and 200,000 USD respectively. The fifth question is "If you win 500,000 (in 2002)/1 Million (in 2014) USD from lottery, what will you do in the first choice?" This is a huge amount of money in Turkey. The results are given in Table 11. In 2002, 60% of the married respondents and 58% of the PhD holders wanted to continue their current jobs as their first choice. Only 16% of the married respondents and 17% of the PhD holders wanted to quit and immigrate to a new country. Although in 2014, 79% of the married respondents and 76% of the PhD holders wanted to continue their current jobs as their first choice. Only 8% of the married respondents and 8% of the PhD holders wanted to quit and immigrate to a new country. This change is interesting that the 20% gain in 12 years show confidence in their current situation and in Turkey. The fifth question's second part is "If you win 500,000 (in 2002)/1 Million (in 2014) USD from lottery, what will you do in the second choice?" The results are given in Table 12. In 2002, 48% of the married respondents and 50% of the PhD holders wanted to continue their current jobs as their second choice. Although in 2014, 41.7% of the married respondents and 44% of the PhD holders wanted to continue their current jobs as their second choice. While comparing the young (MSc-BSc holders) and the singles, they lack of confidence around 30% in the first choice. In 2002, 70% of the single respondents and 72.7% of the MSc-BSc holders wanted to continue their current jobs as their first choice, although, in 2014, 40% of the single respondents and 46.2% of the MSc-BSc holders wanted to continue their current jobs as their first choice. This fact shows that, young ones are lost their confidence drastically, but the older ones gain confidence in 12 years of period. In 2002, 20% of the single respondents and 18.2% of the MSc-BSc holders wanted to continue their current jobs as their second choice, although, in 2014, 46.7% of the single respondents and 42.9% of the MSc-BSc holders wanted to continue their current jobs as their second choice. This is because if their first choice is not actualized, the young academics want to protect their current status in hand.

Table 12. If you win 500,000 (in 2002)/1 Million (in 2014) USD from lottery, what will you do in the second choice?

	2002				2014			
	a	**b**	**c**	**d**	**a**	**b**	**c**	**d**
All respondents	40.0%	28.6%	11.4%	20.0%	43.6%	30.8%	17.9%	7.7%
Male	44.8%	20.7%	10.3%	24.1%	43.3%	30.0%	23.3%	3.3%
Female	16.7%	66.7%	16.7%	0.0%	44.4%	33.3%	0.0%	22.0%
PhD (24-25)	50.0%	16.7%	12.5%	20.8%	44.0%	32.0%	20.0%	4.0%
MSc-BSc (11-14)	18.2%	55.0%	9.0%	18.0%	42.9%	28.6%	14.3%	14.3%
Married (25-25)	48.0%	16.0%	16.0%	20.0%	41.7%	33.3%	20.8%	4.2%
Single (10-14)	20.0%	60.0%	0.0%	20.0%	46.7%	26.7%	13.3%	13.3%

Table 13. If you win 100,000 (in 2002)/200,000 (in 2014) USD from lottery, what will you do in the first choice?

	2002				2014			
	a	**b**	**c**	**d**	**a**	**b**	**c**	**d**
All respondents	88.6%	8.6%	2.9%	0.0%	92.3%	2.6%	2.6%	2.6%
Male	86.2%	10.3%	3.4%	0.0%	93.3%	3.3%	3.3%	0.0%
Female	100.0%	0.0%	0.0%	0.0%	88.9%	0.0%	0.0%	11.1%
PhD (24-25)	87.5%	8.3%	4.2%	0.0%	100.0%	0.0%	0.0%	0.0%
MSc-BSc (11-14)	90.9%	9.1%	0.0%	0.0%	78.6%	7.1%	7.1%	7.1%
Married (25-25)	84.0%	12.0%	4.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Single (10-14)	100.0%	0.0%	0.0%	0.0%	80.0%	6.7%	6.7%	6.7%

The sixth question is "If you win 100,000 (in 2002)/200,000 (in 2014) USD from lottery, what will you do in the first choice?" The results are given in Table 13. In 2002, 84% and 87.5% of the married and of the PhD holders respectively wanted to continue their current jobs as their first choice. Although in 2014, 100% of the married and of the PhD holders wanted to continue their current jobs as their first choice. These results are expected, because someone can not buy a decent flat with 200 000 USD in Istanbul in 2014. The sixth question's second part is "If you win 100,000 (in 2002)/200,000 (in 2014) USD from lottery, what will you do in the second choice?" The results are given in Table 14. In 2002, 52% of the married respondents and 58.3% of the PhD holders wanted to continue their current jobs as their second choice. Although in 2014, 58.3% of the married respondents and 60% of the PhD holders wanted to continue their current jobs as their second choice. In 2002, 100% of the single respondents and 90.9% of the MSc-BSc holders wanted to continue their current jobs as their first choice, although, in 2014, 80% of the single respondents and 78.6% of the MSc-BSc holders wanted to continue their current jobs as their first choice. This fact shows that, 100,000 USD in 2002 and 200,000 USD in 2014 are not enough money for a risk free living. In 2002, 30% of the single respondents and 18.2% of the MSc-BSc holders wanted to continue their current jobs as their second choice, although, in 2014, 40% of the single respondents and 35.7% of the MSc-BSc holders wanted to continue their current jobs as their second choice.

Table 14. If you win 100,000 (in 2002)/200,000 (in 2014) USD from lottery, what will you do in the second choice?

	2002				**2014**			
	a	b	c	d	a	b	c	d
All respondents	45.7%	17.1%	8.6%	28.6%	51.3%	25.6%	10.3%	12.8%
Male	41.4%	20.7%	6.9%	31.0%	53.3%	26.7%	13.3%	6.7%
Female	66.7%	0.0%	16.7%	16.7%	44.4%	22.2%	0.0%	33.3%
PhD (24-25)	58.3%	8.3%	8.3%	25.0%	60.0%	24.0%	4.0%	12.0%
MSc-BSc (11-14)	18.2%	36.4%	9.1%	36.4%	35.7%	28.6%	21.4%	14.3%
Married (25-25)	52.0%	12.0%	12.0%	24.0%	58.3%	25.0%	4.2%	12.5%
Single (10-14)	30.0%	30.0%	0.0%	40.0%	40.0%	26.7%	20.0%	13.3%

Results and Conclusions

The relationship between income and job and life satisfaction is positively correlated. Increased income and wealth can lead to increased job and life satisfaction, because money is used to satisfy needs. Howell et al. (2013) indicated that in older adults as economic standing rises, so a safety need of financial security and minimum risk taking rises, which in turn increases overall job satisfaction. Increasing economic standing may also help academics satisfy their major academics related needs. One's financial security is an important outcome of socio-economic status that influences well-being. Increased well-being and income may be positively correlated with social support (Biswas-Diener & Diener 2001). Also changes in financial status over time, either positive or negative, may influence financial security (Moghaddam 2008). A good salary is regarded as one of the most important factor to motivate employees. A higher level of pay satisfaction can motivate employees to work harder. For the academic staff, beyond the economic satisfaction, social status quo is another important factor for motivation, especially in Turkey. Academics experiencing various positions use different criteria when determining their overall job satisfaction, of which financial security is potentially one prominent factor, the other is social status quo. In general, financial security can be obtained by inheritance or by a good salary.

For the singles and younger MSc-BSc group, there was a solid relationship between economic standing and job satisfaction in 2002. However, such dense bond could not occurred in 2014. The MSc-BSc holders responded that, they are perfectly or moderately satisfied (71.4%) with their current economic condition in 2014. The singles responded that, they are perfectly or moderately satisfied (64.3%) with their current economic condition in 2014. But when asked for if they win a big amount of money from lottery, what they will do in the first choice, they accept this an opportunity to leave the academic life. The MSc-BSc holders who are willing to leave the academic life are 53.8%, 35.7% and 21.4% for the amount of money win from the lottery in 2014 1 Million and 200,000 USD respectively. The singles who are willing to leave the academic life are 60% and 20% for the amount of money win from the lottery in 2014 1 Million and 200,000 USD respectively. This is due to the fact that younger generation in academics could possibly have lesser financial problems; they have no responsibility for a family, no education concerns about the children, probably staying with the parents or on campus housing. Moreover they explicitly see that their professor's social and economic situation is not good

enough what they expected. Furthermore, one can conclude that almost half of the younger academics are lack of academic curiosity.

For the older PhD holder group provided support for the connection between economic standing and job satisfaction is mediated by both economic and social status quo satisfactions, although, social status quo satisfaction seems the stronger parameter. The PhD holders responded that they are perfectly or moderately satisfied with their current economic condition 33.3% in 2002 and 52% in 2014, and they are perfectly or moderately satisfied with their social status quo 54.2% in 2002 and 56% in 2014. On the other hand, the PhD holders who want to continue their current job situation in case of a lottery win 58.3% and 87.5% in 2002 and 76% and 100% for the amount of money winning from the lottery in 2014 1 Million and 200,000 USD respectively. This is due to the fact that the older PhD holders do not want to risk and change their current situation. In addition to more than half of the PhD holders are satisfied with their social status quo. One other reason is that, they do not rely on themselves or the country they live in, so they do not want to take risks to start a new life. It is documented that job satisfaction increases with age (Crooker and Near 1998; Bos et al. 2009). The findings indicate that academic positional tenure level and age are factors that are positively important in the job satisfaction in 2014, although, younger academic staff has lack of confidence for their future. They feel unsecure with their current and future positions. Findings from the current study provide that money can buy satisfaction through increased economic status.

In one study, Cummins et al. (2003) found that future security in general was reduced among adults age 36 to 45; and while they assumed that they were taping into financial security, and Zumbo & Michalos (2000) examined financial security as a predictor of life satisfaction and found that financial security was a good predictor of satisfaction for a number of groups including students; this hypothesis is not verified. Vice versa between the adults age 36-45 is a specific age group that have PhDs, and have children of school ages, so the future security is increased among them. This diversity is assumed to exist due to the cultural differences between western and eastern parts of the world, where Turkey is located in between the two.

Concerning the job characteristics, job level is important for increasing the continuation commitment of academic staff. The females are more committed than males. According to Seifert & Umbach (2008) female academics are always less satisfied than their male counterparts. Nevertheless this assumption is not confirmed here, because there is no difference between the salaries of male and female academics in Turkish public universities. Besides, in Turkey men are typical breadwinners, so female academics less are worried about financial issues. This is true both married and single women. Generally, if married, the husband takes the financial responsibility, if single, she probably lives with her parents or family (with siblings, cousins, etc). In 2002 young academic staff are more committed than the professors, whereas in 2014 the older professors are more committed than their young counterparts. The young academic staff satisfaction with the social status quo increased in 2014. Overall satisfaction with current occupation is improved in 2014. Choosing the profession by personal decision are high in both young and older academic staff. Singles are assumed to know what they want compared to married counterparts, both in 2002 and 2014. The results reveal that age, compensation, and positional tenure have significant effects on the job satisfaction and the commitment. Similar findings are also reported in Filiz (2014).

For the future research, the same questionnaire can be done ten years later to observe the change of the determinants of job satisfaction and the commitment among the academic staff. The author is aware that the research has some limitations that must be considered in evaluating the study's findings. The respondents were all employed at the same faculty in Turkey. Although there is no reason to believe that the relations observed are unique to the faculty or university, generalizations to other faculties and universities should be made wisely, although the author biased to think that the relations can be generalized to Turkish public universities.

References

Altbach, P. G. (Ed.). (2003). *The Decline of the Guru: The Academic Profession in Developing and Middle-Income Countries*. New York, NY: Palgrave Macmillan.

August, L., & Waltman, J. (2004). Culture, climate, and contribution: Career satisfaction among female faculty. *Research in Higher Education, 45*(2), 177-192.

Bentley, P.J., Coates, H., Dobson, I.R., Goedegebuure, L., & Meek, L.V. (Eds.). (2013a). *Job Satisfaction around the Academic World*. Dordrecht: Springer.

Bentley, P.J., Coates, H., Dobson, I.R., Goedegebuure, L., & Meek, L.V. (2013b). Academic Job Satisfaction from an International Comparative Perspective: Factors Associated with Satisfaction Across 12

Countries. In Bentley, P.J., Coates, H., Dobson, I.R., Goedegebuure, L., & Meek, L.V. (Eds.), Job Satisfaction around the Academic World (pp 239-262), Dordrecht: Springer.

Biswas-Diener, R., & Diener, E. (2001). Making the best of a bad situation: Satisfaction in the slums of Calcutta. *Social Indicators Research, 55*, 329-352.

Bos, J.T., Donders, N.C.G.M., Bouwman-Brouwer, K.M., & Van der Gulden, J.W.J. (2009). Work characteristics and determinants of job satisfaction in four age groups: university employees' point of view. *Int Arch Occup Environ Health*, *82*, 1249-1259.

Bozeman, B., & Gaughan, M. (2011). Job Satisfaction among University Faculty: Individual, Work, and Institutional Determinants. *The Journal of Higher Education, 82*(2), 154-186.

Burrus, J., & Roese, N.J. (2006). Long ago it was meant to be: the interplay between time, construal, and fate beliefs. *Pers Soc Psychol Bull, 32*(8), 1050-1058.

CBRT (2014, July 5). Central Bank of the Republic of Turkey foreign exchange rates. Retrieved from http://www.tcmb.gov.tr/wps/wcm/connect/TCMB+TR/TCMB+TR/Main+Menu/Istatistikler/Doviz+Kurlari/Gosterge+Niteligindeki+Merkez+Bankasi+Kurlarii

Crooker K.J., & Near, J.P. (1998). Happiness and satisfaction: Measures of affect and cognition? *Social Indicators Research*, *44*, 195-224.

Cummins, R. A., Eckersley, R., Pallant, J., Van Vugt, J., & Misajon, R. (2003). Developing a national index of subjective wellbeing: The Australian unity wellbeing index. *Social Indicators Research*, *64*, 159-190.

Demerouti, E., Bakker, A.B., Nachreiner, F. & Schaufeli, W.B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology*, *86*, 499-512.

Enders, J.; & Teichler, U. (1997). A victim of their own success? Employment and working conditions of academic staff in comparative perspective. *Higher Education*, *34*(3), 347-372.

Filiz, Z. (2014). An Analysis of the Levels of Job Satisfaction and Life Satisfaction of the Academic Staff. *Social Indicators Research*, *116*, 793-808.

Heijstra, T., Bjarnason, T., & Rafnsdóttir, G.L. (2015). Predictors of Gender Inequalities in the Rank of Full Professor. *Scandinavian Journal of Educational Research*, *59*(2), 214-230.

Horton, S. (2006). High aspirations: differences in employee satisfaction between university faculty and staff. *Applied Research in Quality of Life*, *1*(3), 315-322.

Howell, R.T., Kurai, M., & Tam, L. (2013). Money Buys Financial Security and Psychological Need Satisfaction: Testing Need Theory in Affluence. *Social Indicators Research*, *110*, 17-29.

Iiacqua, J. A., Schumacher, P., & Li, H. C. (1995). Factors contributing to job satisfaction in higher education. *Education, 116*(1), 51-61.

Lacy, F.J., & Sheehan, B.A. (1997). Job satisfaction among academic staff: An international perspective. *Higher Education*, *34*(3), 305-322.

Love, K.M., Tatman, A.W., & Chapman, B.P. (2010). Role stress, interrole conflict, and job satisfaction among university employees: the creation and test of a model. *Journal of Employment Counseling*, *47*, 30-37.

Machado-Taylor, M.L., White, K., & Gouveia, O. (2014). Job Satisfaction of Academics: Does Gender Matter? *Higher Education Policy*, *27*, 363-384.

Machado-Taylor, M.L., Soares, V.M., Brites, R., Ferreira, J.B., Farhangmehr, M., Gouveia, O., & Peterson, M. (2016). Academic job satisfaction and motivation: findings from a nationwide study in Portuguese higher education. *Studies in Higher Education*, *41*(3), 541-559.

Mamiseishvili, K., & Rosser, V. J. (2010). Examining the relationship between faculty productivity and job satisfaction. *Journal of the Professorate, 5*(2), 100-132.

Medawar, P.D. (1979). *Advice to A Young Scientist*. New York, NY: Harper and Row.

Mirah, D., Rowe, A., Atkinson, C., & Sutton, A. (2016). The impact of job performance enablers on job performance capability: an empirical study on Kingdom of Saudi Arabia (KSA) Universities located in Jeddah, *Journal of Business & Management (COES&RJ-JBM)*, *4*(2), 72-92.

Moghaddam, M. (2008). Happiness, faith, friends, and fortune-Empirical evidence from the 1998 US survey data. *Journal of Happiness Studies*, *9*, 577-587.

Oshagbemi, T. (2003). Personal correlates of job satisfaction: empirical evidence from UK universities. *Int J Soc Econ*, *30*(12), 1210-1232.

Saner, T., & Eyupoglu, S.Z. (2012). The Age and Job Satisfaction Relationship in Higher Education. *Procedia-Social and Behavioral Sciences, 55*, 1020-1026.

Saner, T., & Eyupoglu, S.Z. (2013). The Gender-marital Status Job Satisfaction Relationship of Academics. *Procedia-Social and Behavioral Sciences*, *106*, 2817-2821.

Seifert, T.A., & Umbach, P.D. (2008). The Effects of Faculty Demographic Characteristics and Disciplinary Context on Dimensions of Job Satisfaction. *Research in Higher Education*, *49*, 357-381.

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Effects of Scaffolds and Scientific Reasoning Ability On Web-Based Scientific Inquiry

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Abstract

This study examined how background knowledge, scientific reasoning ability, and various scaffolding forms influenced students' science knowledge and scientific inquiry achievements. The students participated in an online scientific inquiry program involving such activities as generating scientific questions and drawing evidence-based conclusions, while being scaffolded either directly or indirectly. Results indicated that student knowledge and scientific reasoning can predict scientific inquiry ability development. Only scientific reasoning has a significant effect on student comprehension. Level of scientific reasoning and types of scaffolding significantly influenced students' scientific inquiry abilities. In particular, prior reasoning skills significantly affected how they identified variables and made conclusions in both post- and retention tests. Students who used the online program benefitted from direct scaffolding, which helped them make hypotheses and draw conclusions better than indirect scaffolding. Direct scaffolding was especially useful for students with high prior reasoning skills. Students with high prior reason skills who used direct scaffolding were better able to make hypotheses and draw conclusions.

Key words: Scaffolding, Direct and indirect scaffolding, Scientific inquiry, Web-based learning

Introduction

Researchers and educators frequently recognize the various benefits that inquiry-based learning has for student learning, and have paid particular attention to scientific inquiry, which many countries encourage their teachers to apply in their science classrooms. In China, for instance, scientific inquiry is one of the key elements in their recent basic educational reform (Wang, Zhang, Clarke, & Wang, 2014). Australian science curricula also reiterate the effort to engage students in scientific inquiry activities by broadly applying inquiry-based teaching and learning from Foundation to Year 10 (Australian Curriculum, Assessment and Reporting Authority, 2015). According to the National Research Council's (2000) scientific inquiry standards, middle school students need to possess such fundamental scientific inquiry abilities as identifying questions, designing and conducting scientific investigations, using appropriate tools and techniques to collect and analyze data, and making evidence-based explanations. When students can devote most of their time to hands-on activities and drawing conclusions from data, they are most likely to "learn science content and gain insights about science" (Jiang & McComas, 2015, p.574). Elliott and Paige (2010) showed that Australian secondary school students believed that they learned science best by doing, and that the use of technology would enhance their science lessons. Research has documented that inquiry-based learning enhances students' scientific reasoning skills. Gerber and his colleagues (2001) found that students in an inquiry-based science classroom achieved higher scientific reasoning abilities than those exposed to non-inquiry science learning. Research suggests that children aged 10 to 12 are "developing and consolidating a variety of new skills in scientific reasoning, including the generation and interpretation of evidence" (Schauble, Glaser, Duschl, Schulze, & John, 1995, p.160). Despite this, Australian students in the 2006 PISA report admitted that they did not regularly experience student-led inquiry (Woods-McConney, Oliver, McConney, Schibeci, & Maor, 2014). Therefore, further studies must explore the practice of inquiry-based teaching and learning, including how to support student learning and the factors which may influence the results of implementing inquiry activities.

While scientific inquiry promotes the development of one's problem solving, critical thinking, and communication abilities, students often encounter difficulty with scientific inquiry (Cuccio-Schirripa & Steiner, 2000; van Rens, Pilot & van der Schee, 2010). To solve this, the current study explores various attributes that

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might affect the development of scientific inquiry skills. We are particularly interested in how internal cognitive ability (i.e. background knowledge and reasoning ability) and external environmental factors (i.e. instructional scaffolding) affect students' engagement in the scientific inquiry process. Robert Glaser identified the effective use of one's prior knowledge and cognitive ability as one of the seven principles in instructional design that can support and scaffold new learning in a particular domain (Bransford, Brown, & Cocking, 1999). Hmelo-Silver and Azevedo (2006) also noted that students need to have some background understanding, such as domain knowledge and scientific reasoning skills, in order to learn about complex simulations or models. In addition, scientific inquiry combines ''the use of processes of science and scientific knowledge" as students "use scientific reasoning and critical thinking'' (National Research Council, 1996, p. 105). But the extent to which reasoning ability influences scientific inquiry remains unclear.

Background

Scientific inquiry

Scientific inquiry often appears in different forms but usually follows Cuevas and colleagues' (2005) generic inquiry framework. Scientific inquiry starts with generating questions which encourage students to state a problem and make a hypothesis, followed by planning (making plans), implementing (carrying out investigation), drawing conclusions, and reporting findings.

The advantages and significance of encouraging students to compose their own research questions has been well documented. Forming research questions stimulates excitement and curiosity (Keys, 1998), and is therefore likely to motivate students to learn (Graesser & Olde, 2003). In this regard, questioning helps individuals explore new concepts and encourages them to think about the relationships among questions, tests, evidence, and conclusions (Keys, 1998). Cuccio-Schirripa and Steiner (2010) stated that questioning is "one of the thinking processing skills which is structurally embedded in the thinking operations of critical thinking, creative thinking, and problem solving" (p.210). A lack of student questions would be "a serious barrier that prevents other components of inquiry from developing" (Graesser, McNamara, & VanLehn, 2005, p.226). In particular, students do not always have sufficient knowledge or experience to ask high order questions, and may require additional support (Kaya, 2015).

In spite of its importance, scholars recognize that students have difficulty posing questions. Researchers suggested that most middle school students had difficulty forming researchable questions (Cuccio-Schirripa & Steiner, 2000). One study suggested that students cannot ask meaningful questions without the support of instructional scaffolding (Olsher, 1999), perhaps because limited prior experience or knowledge about the topic may prevent students from asking appropriate questions. In this regard, the quality of students' questions tend to be disappointing (Graesser et al., 2005).

Generating a hypothesis is an important feature of scientific inquiry as it leads individuals to test ideas. When an individual formulates a hypothesis, he tries to make a "tentative specification of the relation between input and output variables" (de Jong, 2006, pp.111). However, some studies have noted that students have difficulty finding correct variables, stating testable hypotheses, and drawing appropriate conclusions. Young learners tend to have difficulty generating complex hypotheses that involve the interactions between two variables (Wilhelm, Beishuizen, & van Rijn, 2005). Wilhelm and colleagues (2005) found that sixth grade students could not state complex hypotheses, nor could they "translate their data into valid statements about the effects of the input variables on the output variables" (p. 942) They also noted that manipulating multiple variables might make it more difficult for students to inspect data sets, which might result in the students overlooking evidence. These problems were not found among young learners only; even college students might not know how to make hypotheses (Guisasola, Ceberio, & Zubimendi, 2006).

Reasoning

Reasoning, scientific inquiry, and critical thinking are interrelated. Reasoning, broadly defined, encompasses the "ability to think and to make logical and rational decisions" (Lajoie, Guerrera, Munsie, & Lavigne, 2001, p.158). Scientific reasoning involves activities such as generating, testing and revising theories, and reflecting on the process of knowledge acquisition and change (Zimmerman, 2007). Thus, reasoning promotes the development of scientific knowledge. Reasoning and critical thinking also influence student conceptual understanding and science literacy (Hand, Prain, Lawrence, & Yore, 1999).

Scientific reasoning abilities can be categorized into three learning cycles: descriptive, empirical-abductive, and hypothetical-deductive (Lawson, Abraham, & Renner, 1989). Among these, Grandy and Duschl (2007) argue that hypothetical-deductive reasoning especially dominates science education. According to Lawson (2003), scientific inquiry is determined by cycles of hypothetical-deductive reasoning. This inquiry model focuses on designing an experiment and using the experimental results to validate a hypothesis (Oh, 2010). For example, hypothetical-deductive reasoning guides students to test alternative hypotheses using such prompt as "if….and…then…therefore…" (Lawson, 1999). In addition, the ability to compose research questions might depend upon one's hypothetical-deductive reasoning ability (Chin, 2002). In sum, hypothetical-deductive reasoning promotes critical thinking by encouraging learners not only to make observations from experiments but also to draw evidence-based conclusions.

Considering the importance of reasoning to science education, researchers have actively explored how reasoning affects student learning. For example, Lawson, Banks, and Logvin (2007) found that reasoning ability strongly predicted self-efficacy achievement. In their 1995 study, Williams and Cavallo concluded that one significant predictor of college students' understanding of physics concepts was their formal reasoning ability. In addition, both Cavallo (1996) and Chang (2010) showed that reasoning ability predicted secondary school student abilities to solve science problems. Even for college students, prior reasoning ability was an important predictor of biology comprehension in inquiry classes (Johnson & Lawson, 1998). Whereas science education researchers have found that reasoning ability has a positive effect on scientific inquiry, the question of to what extent prior reasoning ability and other attributes influence the scientific inquiry process of secondary school students still remains unclear.

Scaffolding

Scaffolding derives from the Zone of Proximal Development (ZPD) framework addressed by Vygotsky. ZPD refers to the difference between an individual's current capability and the potential which he can achieve through instructional support. While engaging in complex scientific inquiry activities, students often require instructional support. For example, students with little science inquiry experience may not know how to do the assigned work and understand what the process entails (Quintana & Fishman, 2006). One study showed that some higher-level secondary education students had difficulty identifying key concepts such as dependent variables (Arnold, Kremer, & Mayer, 2014), thus indicating that instructional scaffolds that support "procedural knowledge and understanding" (p.2719) during inquiry tasks are needed. Also, even though students are able to design and carry out simply investigation, they often "collect insufficient or inadequate data, and state conclusions that are inconsistent with their data or are not warranted by it" (Kanari & Millar, 2004, p.749). Furthermore, Oh (2010) pointed out that not all science studies provide necessary support and guidance to help students with inquiry procedures. Therefore, using scaffolds to help learners achieve independent learning deserves researchers' special attention.

Scaffolds designed in prior computer-mediated research generally support student learning for different purposes. Among these, conceptual scaffolding refers to the support which guides individuals to determine what knowledge to consider (Hannafin, Land, & Oliver, 1999; Saye & Brush, 1999).Conceptual scaffolds include prompts, hints, or organized structures to help individuals identify key conceptual knowledge and use relevant information in the learning context. For instance, Brush and Saye (2001) used an interactive essay to provide an overview of an historical event and suggestions for possible direction that students may explore. They also highlighted menus designed to assist students with selecting key documents to explore. Rosenshine, Meister, and Chapman (1996) also noted that diverse types of prompts may lead to different learning effects. For example, scaffolds may be delivered explicitly or implicitly. Lorch, Jr., and colleagues (2010) stated that "learning is much faster if students are systematically guided through the logic and/or the logic is explicitly presented for them" (p.91). They believed that explicit instruction and opportunities for exploratory, hands-on experimentation both help students learn how to control variables. Directive scaffolding often seems especially appropriate for young children (Sharma & Hannafin, 2007). Sharma and Hannafin (2007) further suggested that directive scaffolds may help to correct misunderstanding whereas non-directive ones may trigger metacognitive exploration of understanding. However, this perspective still lacks the support of experimental studies. Therefore, this research compares how directive and non-directive scaffolding influence student online inquiry learning.

Purposes of the Study

The present study aims to investigate how different types of scaffolding and student prior reasoning skills influence scientific inquiry development. Four research questions guided the present study:

1. To what extent does biology comprehension and scientific reasoning skills predict the development of student scientific inquiry abilities?
2. How do different kinds of scaffolding and levels of prior reasoning skills influence students' biology comprehension and scientific inquiry scores?
3. How do different kinds of scaffolding and levels of prior reasoning skills influence students' scientific inquiry abilities in web-based environments?
4. For students with different levels of prior reasoning skills, does the use of various kinds of scaffolding influence the development of their online scientific abilities?

Methods

Research design and participants

We adopted a quasi-experimental design to investigate how different types of scaffolding and levels of prior reasoning abilities influence student learning. The participants were randomly assigned to one of the four experimental conditions so that two of four classes implemented one of the two types of scaffolding (direct or indirect) and the other two classes used the other type. Students' reasoning knowledge which was measured before the intervention was also divided into two levels (low and high) and thus considered as one of the independent variables. The dependent variables included student biology comprehension, reasoning skills, and scientific inquiry abilities.

The participants in this study were 138 seventh grade students from a junior high school in Northwestern Taiwan. They all came from one of four science classes, taught by two instructors. The number of students in each class was ranged from 33 to 36. The participating students had not previously learned the curriculum before the intervention.

Instructional program

A web-based scientific inquiry program was developed for this study. The program included three learning units (nerve system, plants and environments, and respiration) and one practice unit. Before the intervention, students joined a practice learning unit to familiarize themselves with the web-based learning environment and the instructional scaffolding. Each science learning unit included two main topics. During the learning units, students conducted three web-based inquiry learning activities (learning scientific concepts, generating scientific questions, making hypotheses) and hands-on scientific experiments based on these activities. Students then reported their experimental results and scientific explanations online which were supported with experimental data. To help students visualize the concepts, the content was presented with animation in the computer program (see Figure 1).

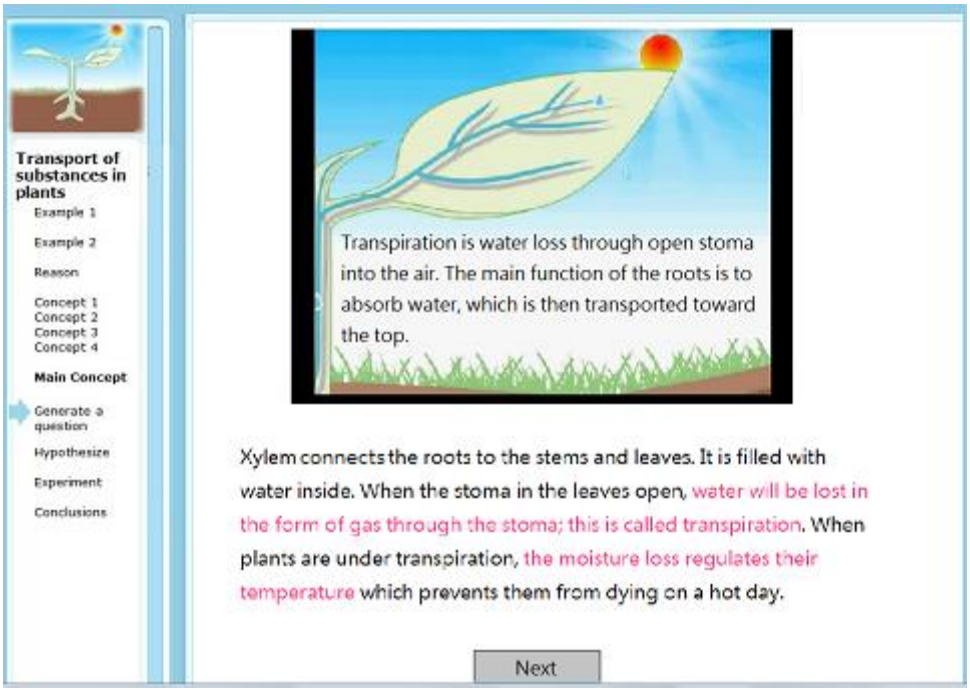

Figure 1. An example of concept presentation in the program

Instructional scaffolding

The participants were given one of two instructional scaffolds (direct or indirect) to support each scientific inquiry step. Both scaffolding conditions began with an identical learning unit involving the presentation of term definitions and examples of scientific inquiry steps (generating scientific questions, identifying operating and dependent variables, and making hypotheses). For example, the web-based learning program helped students formulate scientific questions by suggesting that they "*identify variables and operate particular conditions in experiments (i.e. the condition of more and less leaves) in order to observe their effects (i.e. the speed of evaporation). You should also use some tools and materials to verify the hypotheses in order to form reasonable scientific questions.*" After this presentation, each scaffolding condition provided either indirect or direct scaffolding support.

Indirect and direct scaffolding. The main difference between indirect and direct scaffolding is the level of instructional support given to students when they develop conceptual knowledge during the inquiry procedure. Scientific inquiry activities in the current study began with concept learning. At this phase, direct scaffolding provided individuals with basic conceptual support in order to help them develop necessary cognitive skills. It was designed based on the principle of direct instructional guidance (Kirschner, Sweller, & Clark, 2006) which provided students with information to help them understand concepts. Direct scaffolding first introduces several scientific concepts to students and continually prompts them to think about the unit's main concepts.

In contrast, indirect scaffolding provides individuals with advanced conceptual support to help students recognize the level of their content knowledge, thereby strengthening their conceptual understanding and enhancing their critical thinking. As each scientific concept in the unit was introduced, the students were given a multiple-choice question and required to explain their response. Thus, students were prompted to think about scientific concepts before they were prompted to organize and develop an understanding of the main concept. The presentation of their learning process thus attempted to promote their higher order thinking.

Direct and indirect scaffolds provided different levels of assistance to support student formulating scientific questions. Direct scaffolds required students to respond a multiple-choice question for the main concepts they have learned earlier and reiterated their main concept to help students discover science questions on their own (see Figure 2). The scaffolds gave students hints regarding to the scientific question generation, such as "*It is still unclear what the relationships exist among the speed of transpiration, the number of leave and the rate of water transportation upwards*" In contrast, indirect scaffolding created a subject-specific contextual scenario to remind students of targeted concepts. The scenarios in indirect scaffolding help students to identify possible scientific questions through contextual hints. In addition, it promotes critical thinking by adding different or

even conflicting perspectives (see Figure 3). For instance, students learned that plants absorb water through roots and transport it upwards. But they were also reminded that water moves from high levels toward low levels.

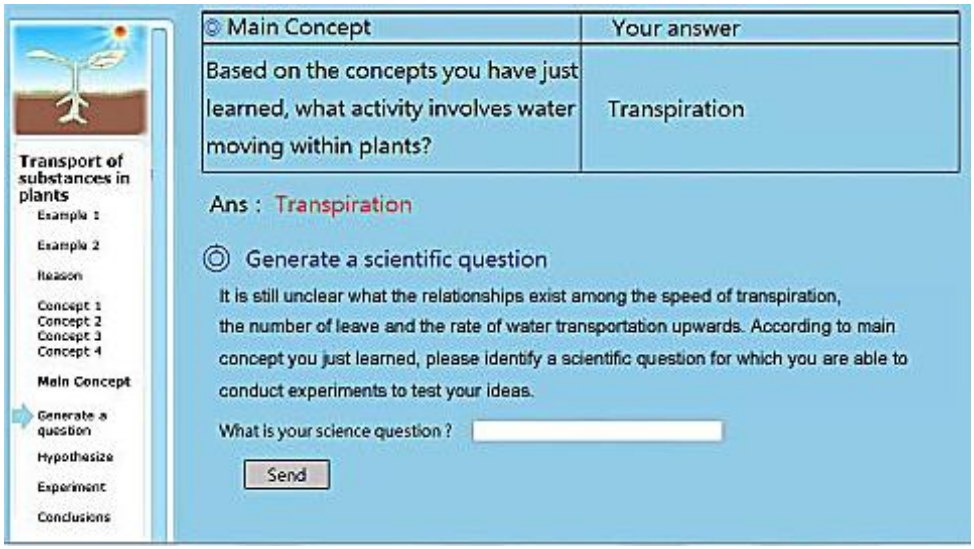

Figure 2. Direct scaffolding example in the web-based inquiry program

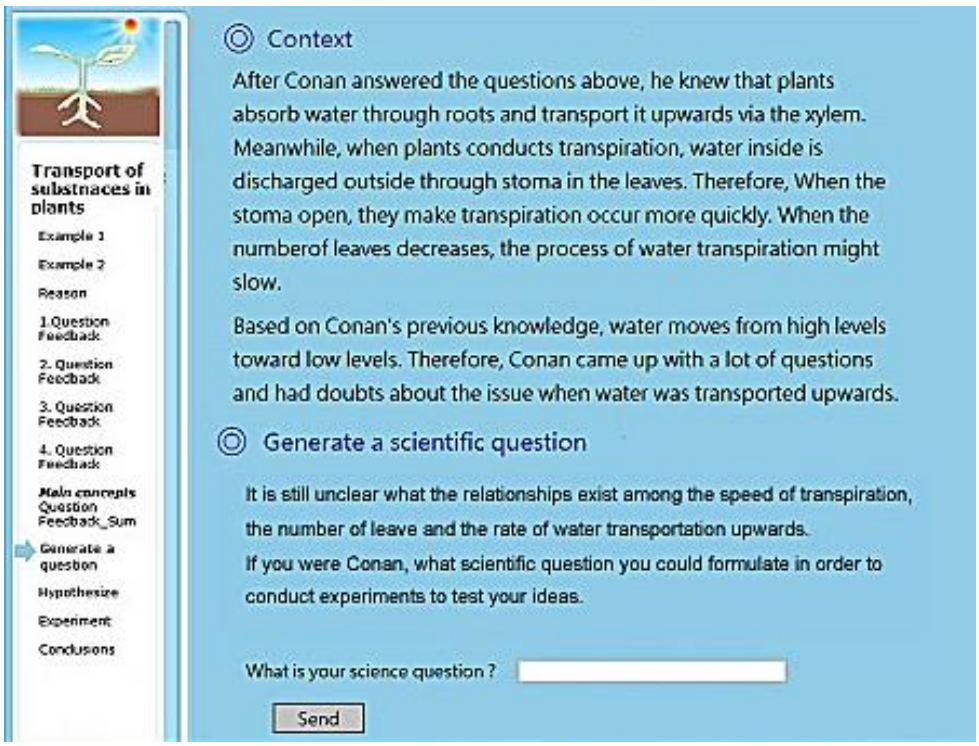

Figure 3. Indirect scaffolding example in the web-based inquiry program

As far as the next scientific inquiry procedures are concerned, both direct and indirect scaffolds offer identical assistance. Students from both conditions received the same level of support while identifying variables, forming hypotheses, conducting experiments, and making evidence-based explanations. During the "forming hypotheses" phase, students were given three generic question stems ("*What is the indepent variable?*", "*What is the dependent variable?*" and "*if……then……*") in order to help them identify variables and how they interact with each other. After students conducted the scientific experiments, the scaffolds offered question stems that prompted students to make conclusions. Students needed to complete such question as "*What were your experimental results?*", "*Were your experimental results support your hypothesis?*", and "*What were your explanations?*"

Data collection

Biology comprehension test

A biology comprehension test was developed to assess how well participants understood the topics covered in this study before, directly after, and three months after the intervention. To achieve this, the test included eight sets of multiple-choice questions which derived from three learning units. Each question was composed of two sub-questions. The first tier of questions measured one's conceptual understanding. Following this, students needed to explain their answer on the second tier of questions which also appeared in multiple choice form. Only when students answered both questions accurately did they gain one score for the set. The test was administered for 30 minutes. The reliability of the pretest, posttest, and retention test was 0.76, 0.89, and 0.95, respectively. The quality of the test was ensured by two science teachers and one science education expert.

Scientific reasoning test

The revised version of Lawson's Classroom Test of Scientific Reasoning is a two-tier instrument which contains twelve sets of multiple choice questions to measure student scientific reasoning before, immediately after, and three months after the intervention. Each question has two tiers, one for solving the problem/making a prediction and the other for providing explanations for the selected answer. The validity and reliability of the test have been established by prior studies (i.e. Lawson, Alkhoury, Benford, Clark, & Falconer, 2000). The test measures student reasoning regarding such aspects as conservation of weight, proportional thinking, identification and control of variables, probabilistic thinking, and hypothetic-deductive reasoning. The answers to a set of questions both need to be accurate in order to receive one point. The reliability of the pretest reached 0.58.

Scientific inquiry abilities

Both quantitative and qualitative data were collected to analyze the participants' scientific inquiry abilities, including generating scientific questions, understanding experimental variables, making hypotheses, and drawing conclusions. First, this study implemented a scientific inquiry multiple-choice test which was administered before, immediately after, and three months after the intervention. The measurement of each topic began with a scenario, followed by four questions. This test assessed the extent of the participants' scientific inquiry abilities, including identifying scientific questions, distinguishing between operating and dependent variables, and recognizing hypotheses. For example, participants were asked, "*Based on the scenario, which of the following scientific questions is reasonable*?" Students received one point when they identified correctly both the operating and dependent variables in each question. As a result, the scores of the scientific inquiry multiple-choice test ranged from 0 to 18. A panel of three science educators examined the test to ensure its validity. The reliability results of the pretest, posttest, and retention test all reached satisfactory levels, with Cronbach's α equal to 0.79, 0.83, and 0.88, respectively. Students' qualitative learning progress was recorded and analyzed in terms of four measurements: forming scientific issues, recognizing variables, making hypotheses, and providing scientific explanations. Two science educators used a rubric (see Table1) to assess the quality of the students' responses to each measure. Based on the rubric, each response was divided into two or three levels (0, 1, or 2). The inter-rater agreement yielded a value of 0.9.

Table 1. *Rubric for measuring web-based inquiry performance*

Inquiry phases	Score levels		
	0	1	2
Formulate scientific questions	Couldn't identify scientific issues which were formed based on key features	Could identify both scientific issues which were formed based on key features and incomplete operating or dependent variables in order to conduct experiments	Could identify both scientific issues which were formed based on key features and complete operating or dependent variables in order to conduct experiments
Identify variables	Included both	Included one incomplete	Included both complete

	incomplete operating and dependent variables	operating or dependent variables	operating and dependent variables
Make hypotheses	*If* was not followed by an operating variable, or *then* was not followed by a dependent variable	*If* was followed by an operating variable, and *then* was followed by a dependent variable	N/A
Draw conclusions	Couldn't describe results and explanations. Or provided inaccurate explanations	Couldn't describe results and explanations. Or provided accurate or partially accurate explanations but was lack of the application of scientific principles	Used scientific vocabularies to provide accurate explanations about scientific concepts

Results

The prediction of both biology comprehension knowledge and scientific reasoning skills on student scientific inquiry abilities

Three multiple regression analyses were conducted to investigate which independent variables (biology knowledge and scientific reasoning ability) were significant predictors of learners' scientific inquiry skills at three measurement periods: before the intervention, immediately after the intervention, and three months after the intervention. A scientific inquiry test was treated as the dependent variable. As shown in Table 2, for the posttest results, only biology knowledge accounted for a significant amount of unique value in predicting student scientific inquiry scores ($p < 0.01$); however, reasoning skills did not significantly predict scientific inquiry posttest scores ($p > 0.05$). But in the retention test, both biology knowledge and reasoning skills significantly predicted scientific inquiry abilities ($p < 0.01$). The adjusted R squared value was 0.54, indicating that 54% of the variance in the scientific inquiry test was explained by the retention test model.

Table 2. *Regression analyses of scientific ability test results*

Model	Outcome variable	Predictor variable	B	SE	β	p
Regression 1: Pretest						
	Scientific inquiry abilities	Biology knowledge	0.33	0.08	0.37	0.00
		Scientific reasoning	0.36	0.17	0.19	0.04
Regression 2: Posttest						
	Scientific inquiry abilities	Biology knowledge	0.40	0.06	0.62	0.00
		Scientific reasoning	0.14	0.17	0.08	0.40
Regression 3: Retention						
	Scientific inquiry abilities	Biology knowledge	0.32	0.05	0.55	0.00
		Scientific reasoning	0.54	0.16	0.26	0.00

The effects of scaffolding types and prior reasoning skills on biology comprehension acquisition

A two-way multivariate analysis of covariate (MANCOVA) approach was employed to measure how different types of scaffolding and levels of prior scientific reasoning skills influenced the development of biology knowledge. A biology test before the intervention was used as the covariate. Student post and retention biology tests were the dependent variables. The assumptions of both equality of error variance and homogeneity of variance-covariance matrices were met. MANCOVA results which are presented in Table 3 showed significant differences between the reasoning groups on the combined dependent variables, $F_{(2, 104)} = 9.30$, $p < 0.01$, Wilk's $\lambda = 0.85$, partial $\eta^2 = 0.15$. Further univariate follow-up analyses revealed that prior scientific reasoning skills influenced both student biology knowledge comprehension posttest ($F_{(1, 105)} = 3.98$, $p = 0.05$, partial $\eta^2 = 0.04$)

and retention test ($F_{(1, 105)} = 18.16$, $p = 0.00$, partial $\eta^2 = 0.15$) scores significantly . Especially, the biology knowledge retention test result revealed that students with high prior reasoning skills had scores that were 4 points higher than those with low prior reasoning skills, approximately four times better than the mean difference of two groups in the posttest. However, students who were supported with either direct or indirect scaffolds did not have significantly different biology knowledge test scores from each other ($p > 0.05$). Neither was a significant interactive effect found between types of scaffolding and prior reasoning levels on biology knowledge comprehension tests ($p > 0.05$). This indicated that different types of scaffolding did not influence students with either low or high prior scientific reasoning skills as regards their development of biology knowledge comprehension.

Table 3. *MANCOVA in biology comprehension and scientific inquiry test*

	Wilk's Λ (Partial η^2)	Multivariate F (p)	Univariate F Posttest (p)	Retention (p)
Biology comprehension				
Pretest	0.43 (0.57)	70.06 (0.00)		
Reasoning	0.85 (0.15)	9.30 (0.00)	3.98[a] (0.05)	18.16[b] (0.00)
Scaffold	0.97 (0.03)	1.50 (0.23)	0.11 (0.75)	2.39 (0.13)
Reasoning X Scaffold	0.99(0.01)	0.64 (0.53)	0.03 (0.87)	0.62 (0.43)
Scientific Inquiry				
Pretest	0.57 (0.43)	38.42 (0.00)		
Reasoning	0.95 (0.05)	2.73 (0.07)	5.37[c] (0.02)	1.82 (0.18)
Scaffold	0.97 (0.03)	1.80 (0.17)	0.09 (0.76)	3.32[d] (0.07)
Reasoning X Scaffold	0.97 (0.03)	1.74 (0.18)	1.62 (0.21)	0.47 (0.50)

Note: a: High reasoning > Low reasoning (mean difference = 1.67)
b: High reasoning > Low reasoning (mean difference = 4.04)
c: High reasoning > Low reasoning (mean difference = 1.36)
d: Direct scaffolding > Indirect scaffolding (mean difference = 1.28)

The effects of different types of scaffolding and levels of prior reasoning skills on scientific inquiry abilities

To determine how types of scaffolding and levels of prior reasoning skills influenced student scientific inquiry abilities, quantitative inquiry posttest and retention test scores were first examined. A two-way MANCOVA was conducted with students' prior test scores as the covariate. The scientific inquiry posttest and retention test scores were treated as dependent variables. The results, as shown in Table 3, show that the combination of different types of scaffolding and prior scientific reasoning levels did not influence students' performance on the scientific inquiry tests ($p > 0.05$). Although types of scaffolding had no significant effect on the combined posttest and retention test outcomes, between-subject analysis indicated that students who used different types of scaffolding had significantly different scientific inquiry retention test scores ($p = 0.07$). Direct scaffolding helped students to perform in scientific inquiry slightly better than indirect scaffolding, with mean difference equaling 1.28. On the other side, there was a significant main effect of prior reasoning on student scientific inquiry test scores, $F_{(2, 103)} = 2.73$, $p = 0.07$, Wilk's $\lambda = 0.95$, partial $\eta^2 = 0.05$. Univariate between-subject tests further revealed a significant effect of different levels of prior reasoning on the scientific inquiry posttest scores, $F_{(1, 104)} = 5.37$, $p < 0.05$, partial $\eta^2 = 0.05$. Students with high prior reasoning skills overall performed better in scientific inquiry abilities (posttest = 1.36 points) than those with low prior reasoning skills. Moreover, each scientific inquiry ability on both the posttest and retention scientific inquiry tests was examined in terms of different prior reasoning levels (see Table 4). The one-way multivariate of analysis showed that students with high prior reasoning skills significantly outperformed those with low reasoning skills in identifying variables and making hypotheses in the posttest.

Table 4. *MANOVA of inquiry tests (pretest reasoning as the factor)*

	Pillai's trace (Partial η^2)	Multivariate F (p)	Univariate F		
			Step I (p)	Step II (p)	Step III (p)
Posttest	0.09 (0.09)	3.84 (0.01)	4.32[a] (0.04)	10.55[b] (0.00)	7.28[c] (0.01)
Retention	0.08 (0.08)	3.43 (0.02)	3.42 (0.07)	9.11[d] (0.00)	6.82[e] (0.01)

Note: Step I = Generate scientific questions, Step II = Identify variables, and Step III = Make hypotheses
a: High reasoning > Low reasoning (mean difference = 0.58)
b: High reasoning > Low reasoning (mean difference = 0.85)
c: High reasoning > Low reasoning (mean difference = 0.76)
d: High reasoning > Low reasoning (mean difference = 0.87)
e: High reasoning > Low reasoning (mean difference = 0.75)

On the other hand, students' online scientific inquiry performance was analyzed by a 2 x 2 MANOVA, with types of scaffolding and prior reasoning skills as independent variables and performances in each scientific inquiry activity throughout three web-supported scientific inquiry units as dependent variables. The dependent variables included four inquiry steps: generating scientific questions, identifying variables, making hypotheses, and drawing conclusions. Assumptions for multivariate tests were met for linearity (Bartlett's test of sphericity, $p<0.001$) and homogeneity of covariances (Box's M test, $p > 0.05$). However, the Levene's tests were not statistically significant for all dependent measures, indicating that homogeneity of variances among the groups was satisfied in all dependent measures except the one *identifying variables.* Thus, Pillai's trace which was most robust to violations of assumptions was used to examine the multivariate tests. MANOVA results showed significant differences between the two scaffolding groups on the combined online scientific inquiry competencies, $F_{(4, 70)} = 3.13$, $p < 0.05$, Pillai's trace = 0.15, partial $\eta^2 = 0.15$. Analyses of variances on each dependent variable (ANOVA) showed that whether students used direct or indirect scaffolding influenced their online scientific inquiry performance significantly when they made hypotheses and provided scientific conclusions (see Table 5). During these two scientific inquiry steps, students in the direct scaffolding groups on average had significantly better performance than those in the indirect scaffolding group.

Table 5. *Measurement of inquiry activities using pretest reasoning and scaffolds*

	Pillai's trace (Partial η^2)	Multivariate F (p)	Univariate F			
			Step I (p)	Step II (p)	Step III (p)	Step IV (p)
Reasoning	0.07 (0.07)	1.39 (0.25)	3.59 (0.06)	0.03 (0.86)	2.40 (0.13)	1.11 (0.30)
Scaffolds	0.15(0.15)	3.13 (0.02)	0.18 (0.67)	3.05 (0.09)	5.77[a] (0.02)	7.01[b] (0.01)
Reasoning X Scaffold	0.04(0.04)	0.69 (0.60)	0.93 (0.34)	0.10 (0.75)	1.08 (0.30)	2.32 (0.13)

Note: Step I = Generate scientific questions, Step II = Identify variables, Step III = Make hypotheses, and Step IV = Draw conclusions
a: Direct scaffolding > Indirect scaffolding (mean difference = 1.13)
b: Direct scaffolding > Indirect scaffolding (mean difference = 1.42)

The effects of prior reasoning skills on online scientific inquiry performance for students with various scaffolds

A one-way MANOVA was conducted to measure how types of scaffolding influenced online scientific inquiry performance for each group of students with high or low prior reasoning skills. Students' online scientific inquiry performances in terms of the four scientific inquiry steps were treated as dependent variables. MANOVA results indicated that different types of scaffolding did not influence student online scientific inquiry performance especially when they had low prior reasoning skills (see Table 6). However, for students with high prior reasoning skills, the types of scaffolding significantly affected online scientific inquiry performance when

engaged in identifying variables, making hypotheses, and providing conclusions, $F_{(4, 42)} = 2.94$, $p < 0.05$, Wilk's $\lambda = 0.78$, partial $\eta^2 = 0.22$. Students with direct scaffolding performed significantly better than those with indirect scaffolding when they made hypotheses and provided conclusions. Direct scaffolding also helped students with high reasoning skills to identify variables in scientific inquiry ($p = 0.06$).

Table 6. *Measurement of inquiry abilities using different reasoning levels*

	Wilk's Λ (Partial η^2)	Multivariate F (p)	Univariate F			
			Step I (p)	Step II (p)	Step III (p)	Step IV (p)
High reasoning students						
Scaffolds	0.78(0.22)	2.94 (0.03)	0.18 (0.68)	3.83[a] (0.06)	6.83[b] (0.01)	9.98[c] (0.00)
Low reasoning students						
Scaffolds	0.85(0.15)	1.08 (0.39)	0.88 (0.36)	0.57 (0.46)	0.93 (0.34)	0.67 (0.42)

Note: Step I = Generate scientific questions, Step II = Identify variables, Step III = Make hypotheses, and Step IV = Draw conclusions

a: Direct scaffolding > Indirect scaffolding (mean difference = 1.76)

b: Direct scaffolding > Indirect scaffolding (mean difference = 1.62)

c: Direct scaffolding > Indirect scaffolding (mean difference = 2.23)

Discussions and conclusions

Scientific inquiry is one of the core elements and significant method of enhancing science literacy, as well as having other beneficial effects on student learning (Schwartz, Lederman, & Crawford, 2004; Abd-El-Khalick, BouJaoude, Duschl, Lederman, Mamlok-Naaman, Hofstein et al., 2004, p.408). The purpose of science education is to enhance students' understanding of the nature of scientific inquiry and develop the ability to use a range of scientific inquiry methods (Australian Curriculum, Assessment and Reporting Authority, 2015). The findings of this study contribute to this effort by broadening our current understanding of inquiry-based instruction, and offering suggested directions for future research studies in the field of science education. In particular, the web-based delivery of inquiry-based instruction in this study will be useful to those interested in developing effective implementation methods for scientific inquiry in Australia, particularly given the fact that the Australia Science Curriculum advocates the use of digital technologies in order to help educators "engage and maintain the interest of students" (National Curriculum Board, pp.12).

The current study explored how different types of scaffolding and student scientific reasoning skills before the intervention influenced students' scientific inquiry abilities. Researchers have investigated the improvement of student scientific inquiry by incorporating various instructional supports. But how each individual's characteristics, such as their initial reasoning skills and prior conceptual understandings, affect student scientific inquiry abilities still requires more research.

Like prior research (Chen & Klahr, 1999), this study found that reasoning skills influenced the acquisition of domain-specific conceptual knowledge. Students with high levels of prior scientific reasoning skills comprehended biology knowledge better than those with low levels of prior scientific reasoning skills in both post and retention conceptual knowledge tests. This result not only confirms Liao and She's (2009) scientific reasoning findings but also indicates that scientific reasoning had the potential to increase conceptual knowledge as indicated in the retention test scores. For participants with high prior reasoning skills, their biological conceptual understanding appeared much improved even long after the intervention ended. The retention test scores of students with high reasoning skills showed higher levels of concept knowledge (M = 15.56) than the posttest scores (M = 12.05).

Students' ability to comprehend scientific concepts and to scientifically reason affected the development of their scientific inquiry abilities to various degrees at various times. The regression analysis of this study showed that biology knowledge significantly predicted student scientific inquiry abilities in the posttest and this effect continuously occurred in the retention test. Minner, Levy, and Century (2009) concluded that encouraging students to think actively and engage constantly in the inquiry process helped them to increase their

understanding of science concepts. In this regard, the scientific inquiry process supports the development of conceptual knowledge, which facilitates the development of scientific inquiry abilities. While student reasoning skill level was not a significant predictor of scientific inquiry abilities in the posttest, it became one of the important indicators for the development of scientific inquiry abilities in the retention test. These findings demonstrated the long term positive effects of scientific reasoning skills on scientific inquiry abilities. In particular, the beta weight in the regression model showed that scientific reasoning skills contributed most to predict scientific inquiry abilities for a long period of time when compared with the effects of biology knowledge.

This study found that the level of scientific reasoning affected the development of scientific inquiry abilities. As indicated in the scientific inquiry posttest, students with high reasoning skills achieved significantly better understanding of scientific inquiry than those with lower reasoning skills when their pretest scores were controlled (Mean difference =1.36, $p < 0.05$). Moreover, students who had higher prior reasoning skills had significantly better understanding in such aspects as generating research questions, identifying variables, and making hypotheses than low reasoning students in the posttest. The findings of the multiple-choice scientific inquiry tests were consistent with Chin (2002) and Chin and Osborne's (2008) studies, indicating that student reasoning ability could affect student-generated questions. Moreover, Germann's (1985) observation regarding reasoning ability could predict student achievement in generating hypotheses was also reflected in the findings of the current study.

In addition, it appeared that the applications of various kinds of scaffolding in the current study only influenced the development of scientific inquiry activities to some extent. While people generally tended to persist in their ideas even when confronted with experimental data (de Jong, 2006), this study found that middle school students were able to make effective conclusions along with evidence-based explanations when provided with appropriate assistance. This was especially evident when students were supported with direct scaffolding. The current study revealed that students who used direct scaffolding outperformed those who used indirect scaffolding in making hypotheses and drawing conclusions deriving from their online learning experiences.

There is no significant difference between the scores of those students with low reasoning skills who use direct and indirect scaffolds. However, significant differences do exist between the scores of students with high reasoning skills who use direct and indirect scaffolds. Direct scaffolding promoted the development of students' high reasoning skills and ability to identify variables, make hypotheses, and compose scientific conclusions. Thus, even students with high reasoning skills still need direct instruction to support their learning in complex web-based inquiry activities. As Hmelo-Silver and Azevedo (2006) indicated, it is crucial for students to have some scientific reasoning skills in order to succeed in complex learning. Lawson (2005) further emphasized that some students lacking advanced hypothetico-deductive reasoning skills might fail to understand scientific concepts and the nature of scientific inquiry. That might explain why students with low reasoning skills did not have significantly different performances when they were supported with different kinds of scaffolding.

Given that different scaffolding use did not significantly influence student performance at each inquiry step, future studies should continue exploring whether additional learning support will improve students' achievements in the phases of scientific inquiry. Azevedo, Winters, and Moos' (2004) study showed that even high school students might use "mostly ineffective strategies and metacognitive monitoring" to regulate their learning (p.235). Thus, participants in the current study might need additional support for their self-regulated inquiry in order to engage in scientific inquiry effectively. In addition, while Sharma and Hannafin (2007) suggested that indirect scaffolding may trigger metacognitive exploration of understanding, the findings of this study did not present such potential in regard to scientific inquiry performance. Although indirect scaffolding in this study provided learners with opportunities to reflect on their conceptual knowledge, the feedback was not given until students answered all questions in the unit. Krajcik and colleagues (1998) suggested that students need to "receive timely, informative, and critical feedback from teachers, peers, and others" (p.342) in order to help students to revise their questions. Future research may investigate whether timely feedback along with indirect scaffolding would affect student learning.

References

Abd-El-Khalick, F., BouJaoude, S., Duschl, R., Lederman, N.G., Mamlok-Naaman, R., Hofstein, A.,et al. (2004). Inquiry in science education: International perspectives. *Science Education*, *88*(3), 397–419

Arnold, J. C., Kremer, K. & Mayer, J. (2014). Understanding students' experiments: What kind of support do they need in inquiry tasks? *International Journal of Science Education*, *36*(16), 2719-2749.

Australian Curriculum, Assessment and Reporting Authority (2015). *Science.* Retrieved September 8, 2015 from http://www.australiancurriculum.edu.au/science/rationale

Azevedo, R., Winters, F., & Moos, D. (2004). Can students collaboratively use hypermedia to learn science? The dynamics of self- and other- regulatory processes in an ecology classroom. *Journal of Educational Computing Research, 31*(3), 215-245.

Bransford, J. Brown, A. & Cocking, R. (1999). *How people learn.* Washington, DC: National Academy Press.

Brush, T. & Saye, J. (2001). The use of embedded scaffolds with hypermedia-supported student-centered learning. *Journal of Educational Multimedia and Hypermedia, 10*(4), 333-356.

Cavallo, A. (1996). Meaningful learning, reasoning ability, and students' understanding and problem solving of topics in genetics. *Journal of Research in Science Teaching, 33*(6), 625-656.

Chang, C. Y. (2010). Does problem solving = prior knowledge + reasoning skills in earth science? An exploratory study. *Research in Science Education, 40*(2), 103-116.

Chen, Z., & Klahr, D. (1999). All other things being equal: Acquisition and transfer of the control of variables strategy. *Child development, 70*(5), 1098-1120.

Chin, C. (2002). Student-generated questions: encouraging inquisitive minds in learning. *Teaching and Learning, 23*(1), 59-67.

Chin, C. & Osborne, J. (2008). Students' questions: A potential resource for teaching and learning science. *Studies in Science Education, 44*(1), 1-39.

Cuccio-Schirripa, S., & Steiner, H. E. (2000). Enhancement and analysis of science question level for middle school students. *Journal of Research in Science Teaching, 37*(2), 210-224.

Cuevas, P., Lee, O., Hart, J., & Deaktor, R. (2005). Improving science inquiry with elementary students of diverse backgrounds. *Journal of Research in Science Teaching, 42*(3), 337-357.

de Jong, T. (2006). Scaffolds for scientific discovery learning. In J. Elen & R. Clark's (Eds), *Handling complexity in learning environments: research and theory* (pp.107-128). UK: Elsevier Science Ltd.

Elliot, K. & Paige, K. (2010). Middle year students talk: Science sux or science rock! *Teaching Science, 56*(1), 13-16.

Gerber, B. L., Cavallo, A. M., & Marek, E. A. (2001). Relationships among informal learning environments, teaching procedures and scientific reasoning ability. *International Journal of Science Education, 23*(5), 535-549.

Germann, P. (1985). Directed-inquiry approach to learning science process skills: Treatment effects and aptitude-treatment interactions. *Journal of Research in Science Teaching, 26*(3), 237-250.

Grandy, R., & Duschl, R. A. (2007). Reconsidering the character and role of inquiry in school science: Analysis of a conference. *Science and Education, 16*(2), 141–166.

Graesser, A. C., & Olde, B. A. (2003). How does one know whether a person understands a device? The quality of the questions the person asks when the device breaks down. *Journal of Educational Psychology, 95*(3), 524-536.

Graesser, A., McNamara, D., & VanLehn, K. (2005). Scaffolding deep comprehension strategies through Point&Query, AutoTutor, and iS.TART. *Educational Psychologist, 40*(4), 225-234

Guisasola, J., Ceberio, M., & Zubimendi, J. L. (2006). University students' strategies for constructing hypothesis when tackling paper-and-pencil tasks in physics. *Research in Science Education, 36*(3), 163-186.

Hand, B., Prain, V., Lawrence, C., & Yore, L. (1999). A writing in science framework designed to enhance literacy. *International Journal of Science Education, 21*(10), 1021-1035.

Hannafin, M., Land, S., & Oliver, K. (1999). Open learning environments: Foundations, methods, and models. In Reigeluth, C. (Ed.) *Instructional Design Theories and Models* (Vol. II). Mahway, NJ: Erlbaum.

Hmelo-Silver, C. & Azevedo, R. (2006). Understanding complex systems: Some core challenges. *The Journal of the Learning Science, 15*(1), 53-61.

Jiang, F. & McComas, W. (2015). The effects of inquiry teaching on student science achievement and attitudes: Evidence from propensity score analysis of PISA data. *International Journal of Science Education*, *37*(3), 554-576.

Johnson, M. A., & Lawson, A. E. (1998). What are the relative effects of reasoning ability and prior knowledge on biology achievement in expository and inquiry classes? Journal of Research in Science Teaching, 35(1), 89-103.

Kanari, Z. & Millar, R. (2004). Reasoning from data: How students collect and interpret data in science investigations. *Journal of Research in Science Teaching, 41*(7), 748-769.

Kaya, S. (2015). The effect of the type of achievement grouping on students' question generation in science. *The Australian Educational Researcher*, *42*(4), 429-411.

Keys, C. W. (1998). A study of grade six students generating questions and plans for open-ended science investigations. *Research in Science Education, 28*(3), 301-316.

Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist, 41*(2), 75-86.

Krajcik, J., Blumenfeld, P. C., Marx, R. W., Bass, K. M., Fredricks, J., & Soloway, E. (1998). Inquiry in project-based science classrooms: Initial attempts by middle school students. *Journal of the Learning Sciences, 7*(3-4), 313-350.

Lajoie, S. P., Guerrera, C., Munsie, S. D., & Lavigne, N. C. (2001). Constructing knowledge in the context of BioWorld. *Instructional Science, 29*(2), 155-186.

Lawson, A.E., Abraham, M.R., & Renner, J.W. (1989). A theory of instruction: Using the learning cycle to teach science concepts and thinking skills. (NARST Monograph No. 1).

Lawson, A. E., Alkhoury, S., Benford, R., Clark, B.R., & Falconer, K.A. (2000). What kinds of scientific concepts exist? Concept construction and intellectual development in college biology. *Journal of Research in Science Teaching, 37*(9), 996-1018.

Lawson, A. E. (1999). A scientific approach to teaching about evolution & special creation. *The American Biology Teacher, 61*(4), 266-274.

Lawson, A.E. (2003). Allchin's shoehorn, or why science is hypothetico-deductive. *Science & Education, 12*(3), 331–337.

Lawson, A. E. (2005). What is the role of induction and deduction in reasoning and scientific inquiry? *Journal of Research in Science Teaching, 42*(6), 716-740.

Lawson, A., Banks, D., & Logvin, M. (2007). Self-efficacy, reasoning ability, and achievement in college biology. *Journal of Research in Science Teaching, 44*(5), 706-724.

Liao, Y. W. & She, H. C. (2009). Enhancing eight grade students' scientific conceptual change and scientific reasoning through a web-based learning program. *Educational Technology & Society, 12*(4), 228-240.

Lorch Jr, R. F., Lorch, E. P., Calderhead, W. J., Dunlap, E. E., Hodell, E. C., & Freer, B. D. (2010). Learning the control of variables strategy in higher and lower achieving classrooms: Contributions of explicit instruction and experimentation. *Journal of Educational Psychology, 102*(1), 90-101.

Minner, D., Levy, A., Century, J. (2009). Inquiry-based science instruction: What is it and what does it matter? Results from a research synthesis years 1984 to 2002. *Journal of Research in Science Teaching, 47*(4), 474–496.

National Curriculum Board (2009). *The shape of the Australian curriculum: Science*. Barton, ACT: Commonwealth of Australia.

National Research Council. (1996). *National science education standards.* Washington, DC: National Academy Press.

National Research Council (2000). *Inquiry and the National Science Education Standards: A Guide for Teaching and Learning.* National Academy Press: Washington, DC.

Oh, P. S. (2010). How can teachers help students formulate scientific hypotheses? Some strategies found in adductive inquiry activities of earth science. *International Journal of Science Education, 32*(4), 541-560.

Olsher, G. (1999). Biotechnologies as a context for enhancing junior high-school students' ability to ask meaningful questions about abstract biological processes. *International Journal of Science Education, 21*(2), 137-153.

Quintana, C. & Fishman, B. (2006). Supporting science learning and teaching with software-based scaffolding. Paper presented in Annual Meeting of American Educational Research Association. San Francisco, CA.

Rosenshine, B., Meister, C., & Chapman, S. (1996). Teaching students to generate questions: A review of the intervention studies. *Review of Educational Research, 66*(2), 181–221.

Saye, J. & Brush, T. (1999). Student engagement with social issues in a multimedia-supported learning environment. T*heory and Research in Social Education, 27*(4), 472-504.

Schauble, L., Glaser, R., Duschl, R. A., Schulze, S., & John, J. (1995). Students' understanding of the objectives and procedures of experimentation in the science classroom. *The journal of the Learning Sciences, 4*(2), 131-166.

Schwartz, R. S., Lederman, N. G., & Crawford, B. (2004). Developing views of nature of science in an authentic context: An explicit approach to bridging the gap between nature of science and scientific inquiry. *Science Education, 88*(4), 610–645.

Sharma, P. & Hannafin, M. (2007). Scaffolding in technology-enhanced learning environments. *Interactive Learning Environment, 15*(1), 27-46.

van Rens, L., Pilot, A., & van der Schee, J. (2010). A framework for teaching scientific inquiry in upper secondary school chemistry. *Journal of Research in Science Teaching, 47*(7), 788-806.

Wang, L, Zhang, R., Clarke, D., & Wang, W. (2015). Enactment of scientific inquiry: Observation of two cases at different grade levels in China Mainland. *Journal of Science Education and Technology, 23*(2), 280-297.

Wilhelm, P., Beishuizen, J. J., & van Rijn, H. (2005). Studying inquiry learning with FILE. *Computers in human behavior, 21*(6), 933-943.

Williams, K. & Cavallo, A. M. L. (1995) Relationships between reasoning ability, meaningful learning and students' understanding of physics concepts. *Journal of College Science Teaching, 24*(5), 311-314.

Woods-McConney, A. Oliver, M. C., McConney, A., Schibeci, R., & Maor, D. (2014). Science engagement and literacy: A retrospective analysis for students in Canada and Australia. *International Journal of Science Education, 36*(10), 1588-1608.

Zimmerman, C. (2007). The development of scientific thinking skills in elementary and middle school. *Developmental Review, 27*(2), 172-223.

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A Study on Teachers' Perceptions of Organizational Identity in terms of Learning School

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Abstract

The aim of this study was to investigate teachers' perceptions of organizational identity in terms of learning school. The data collection of the research consists of a total of 370 teachers who are chosen by random cluster sampling from teachers working in public schools in Konya in 2016. Organizational Identity Perception Scale and Learning School Scale were used to collect data in this research. Data were analyzed by statistical methods. According to findings of the research, there is a significant relationship between teachers' perceptions of organizational identity and schools' quality of being learning school. It is seen that there is a positive significant relationship between identification, goal value sharing, communication, image sub dimensions of teachers organizational identity and team learning, mental models, shared vision, personal mastery sub-dimensions of learning school.

Key words: Teachers, Organizational Identity, Learning School.

Introduction

Every teacher has a different idea about the features of their school from their perspective. Thus, it can be said that each of the teachers working in primary schools has a different perception of identity for their schools. Collective behaviors of individuals at the organizational level relate with how the organizational identity is seen by the member of organization. This means the identity guides in the formation of behaviors. The organization joins to the environment, responds and interprets consistent with the identity (Sethi and Compea, 2002; cited in Tüzün, 2006: 48-49). For this reason, teachers' perceptions of organizational identity has been an important subject of study in recent years. Organizational identity is an improved metaphor to discuss and analyze how individuals in the organization perceive their organizations, what they feel for the organization and what they think. Organization identity consists of the visual elements such as the logo, colors and emblem of the organization with organizational communication, organizational behavior and organizational philosophy. An organization-specific format use of these elements constitute the organization identity of the organization (Cobanoglu, 2008).

Organizational identity is related with what the individuals perceive, what they feel and what they think regarding their organizations (Hatch and Schultz, 1997). How's that for an individual, identity is a set of meanings and beliefs responding to questions "who am I?", the answer to the question ‘’Who are we?’’ is an organizational identity for an organization (Foreman and the Whetten, 2002). Individual identity is perception of people as ‘’who they are’’ and the organizational identity is what the individuals think about their organizations. Organizational identity is is a concept that demonstrates the core features of the organization in the eyes of workers, describing what does not change in the organization in the processes of change and making an organization different, special and unique from other organizations in the eyes of workers (Albert & Whetten, 1985).

Organization identity allows members to identify themselves with the organization. However, the following is required for the realization of this ideal situation (Erdem, 1996: 53; cited in Cansu, 2006: 25): be perceived of the organization identity by the workers, workers' strength of the relationship with

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the organization, satisfaction of the workers' large parts of desires through the organizational framework and be at a minimum level of the competition between members of the organization.

Organizational identity perception is the degree of similarity between the concepts of individual employees as they define themselves and the concepts of they define the organization (Ertürk, 2003). The stronger employees have a sense of organizational identity, the stronger integration of organization they have (Hündür, 2006). Organizational identity creates a psychological bond between employees and organizations, allows coordination. This increases employees' interpersonal trust and the sense of collaboration, motivates the achievement of organizational goals (Tüzün and Çağlar, 2008).

Organizational identity is closely related with good or bad tasks of individuals determining the school's success or failure (Blackmore, 2004). Dutton and Dukerich (1991) concluded in a study that the members of the organization had responses consistently with their perceiving the organizational identity. Similarly, the teachers adopting the identity of learning school can be expected to engage in a consistent and coherent response with these perceptions. Educational institutions' being learning schools can be considered to have an impact on the levels of organizational identity perception of the teachers who work in schools.

In the information society, schools should return not only be teaching institutions but also be learning institutions as education organization. In this society learning by living, learning to learn, responsibility of self-education and lifelong learning stands out as the fundamental values. Schools' adapting to this development will be proportional to the transition speed to be learning school (Töremen, 2001). Educational institutions look for ways to gain competitiveness, to increase efficiency and productivity in a competitive environment imposed by today's society. Therefore, schools should follow the changes in their environment and must adapt to these changes. The only way for that is turning into learning organizations with abandoning the traditional understanding of school education (Jokic, Cosic, Sajfert, Pečujlıj and Pardanjac, 2012). The way schools can keep pace with the rapid changes and fulfill the requirements of information community will accelerate the adoption of learning school approach. The school will provide the change in the society as a learning school. Learning schools are aiming to learn together.

Learning schools are expressed as being adopted in principle constantly with developing of human resources, the development of staff is at the forefront, being encouraged to learn and self-renewal by learning, learning is the basis to change, being considered to be teachers as colleagues and the learning climate supported by staff (Töremen, 2001). Learning School is described that leadership is supportive, decisions are shared, there is a common vision and values, the appropriate learning culture is settled for continuous learning, personal applications are shared and schools that have teams working in cooperation (Carpenter, 2008: 25).

School of the future is a learning school. Learning school will have a unique structure in accordance with the system approach, a management with teamwork in accordance with the contingency theory, an autonomous operation which eliminates bureaucracy for an education process approaching zero defects. Learning schools will try continuous self-recognition, to benefit from the experience, to renew itself with taking into account the internal and external environmental conditions and taking feedback continuously. For this, learning school will make the scientific information instantly accessible when needed by establishing an information and communication systems and will train constantly studying employees (Basaran, 2000: 31). There is is no distinction between teachers and learners in learning schools. Everybody is learners from the school principal to unqualified employees, the students and the parents. School achieves thanks to know capturing the change, learning self-renewal and being contemporary (Özus 2005: 24).

General disciplines of learning organizations are personal mastery, mental models, shared vision, team learning in (Senge, 2002). These disciplines can be explained as follows (İstar, 2006):

- Personal mastery encourages our personal motives for learning how our actions affect our world constantly.
- Creating a Shared Vision encourages attachment to the long-term.
- Mind model provides the necessary clearance for us to manifest inadequacies of the current way of view to our world.
- Team learning develops skills ability to see the big picture lies beyond the individual perspective of human groups.

This research is based on the interaction between the variables of learning school with organizational identity perception of the teachers tried to explain above. The aim of this research is to analyze the properties of learning school in terms of teachers' perceptions of organizational identity. As part of this aim the following questions will be answered:

1. Is there a significant relationship between identification, goal value sharing, communication, image sub dimensions of teachers' perceptions of organizational identity and team learning, mental models, shared vision, personal mastery sub-dimensions of learning school?
2. What level do team learning, mental models, shared vision, personal mastery sub-dimensions of learning school explain variability in the identification dimension of teachers' perceptions of organizational identity?
3. What level do team learning, mental models, shared vision, personal mastery sub-dimensions of learning school explain variability in the goal value sharing dimension of teachers' perceptions of organizational identity?
4. What level do team learning, mental models, shared vision, personal mastery sub-dimensions of learning school explain variability in the communication dimension of teachers' perceptions of organizational identity?
5. What level do team learning, mental models, shared vision, personal mastery sub-dimensions of learning school explain variability in the image dimension of teachers' perceptions of organizational identity?

Method

Research Model

In this study, the relational survey model was adopted. In the study teachers' perceptions of organizational identity were analyzed in terms of the properties of learning school. The dependent variable of the study is teachers' perceptions of organizational identity and the independent variable of the study is the characteristics of learning school.

Study group

The study group of the research consists of a total of 370 teachers who are chosen by random cluster sampling from teachers working in public schools in Konya in 2016. Approximately 53% of teachers are men and 47% are women. Also approximately 34% of teachers are single and 66% are married.

Data Collection Tools

In this study, Organizational Identity Scale was used to measure teachers' perceptions of organizational identity and Learning School Scale was used to measure the characteristics of learning school. Information on the Scales are given below. Organizational Identity Perception Scale developed by Tasdan (2013) was used to teachers' measure perceptions of organizational identity. Scale organized according to the technical point Likert consists of 48 items and 4 sizes. In the analysis of the reliability of the first factor Cronbach Alpha internal consistency coefficient was .97; the second factor was .94; the third factor was .95, and the fourth factor was found .94. The Cronbach's alpha coefficient related with the general scale was identified as .98. Cronbach's alba coefficient of organizational identity scale of the study group was found to be .97.

Learning School Scale developed by Uğurlu, Doğan and Yiğit (2014) was used to to measure the level of being a learning school in which teachers work. The Likert-type scale consists of 20 items and 4-factors and can be said to be a valid and reliable scale. The total value of the reliability of the scale was found to be .92. Cronbach's coefficient of Alba of Learning School Scale in the study group was found to be .95.

Data Analysis

The significance of the relationship between characteristics of learning school and teachers' organizational identities was tested with Pearson moment products correlation coefficients. Learning school characteristics' level of explaning in a meaningful way into teachers' organizational identities was tested by multiple regression technique. The significance level of 0.05 was adopted to analyze the data.

Results and Discussion

In this section, the findings and comments of the statistical analysis of the results of the research done on the sub-problems are given.

Table 1. Correlation between learning organization and organizational identity

			Learning school			
			Team learning	Mental models	Shared vision	Personal mastery
Organizational identity	Identification	r	,635**	,603**	,607**	,368**
		p	,000	,000	,000	,000
	Goal value sharing	r	,656**	,607**	,710**	,583**
		p	,000	,000	,000	,000
	Communication	r	,561**	,644**	,659**	,503**
		p	,000	,000	,000	,000
	Image	r	,557**	,647**	,664**	,496**
		p	,000	,000	,000	,000

p <.05

As shown in Table 1. , İt is seen that there is a positive significant relationship between identification, goal value sharing, communication, image dimensions of teachers' organizational identity and team learning, mental models, shared vision, personal mastery dimensions of learning school.
Explanatory power of the dimensions of learning school to the variability in the identification dimension of teachers' organizational identity was tested by multiple regression, results are given in Table 2.

Table 2. Regression level on the dimensions of learning school into the identification dimension of teachers' organizational identity

The independent variable	R^2	F	p	Dimensions of Learning school	β	t	p
Learning school	0.493	88,44	0,000	Team learning	,35	6,49	0,000
				Mental models	,22	3,98	0,000
				Shared vision	,26	4,31	0,000
				Personal mastery	-,08	-1,65	0,098
The dependent variable: " Identification " dimension of organizational identity.							

p < .05

Schools' learning school property describes 49. 3% of the variability in identification dimension of teachers' organizational identity. When analyzed in terms of the dimensions of the learning school, team learning, mental models and shared vision dimensions of learning school describes the variability in the identification dimension of teachers' organizational identity, but personal mastery dimension doesn't describe the variability in the identification dimension of teachers' organizational identity (p < .05).

Table 3. Regression level on the dimensions of learning school into the goal value sharing dimension of teachers' organizational identity

The independent variable	R^2	F	p	Dimensions of Learning school	β	t	p
Learning school	0.561	132,003	0,000	Team learning	,23	4,74	0,000
				Mental models	,15	3,09	0,002
				Shared vision	,33	5,93	0,000
				Personal mastery	,18	4,23	0,000
The dependent variable: " Goal value sharing " dimension of organizational identity.							

$p < .05$

Schools' learning school property describes 56. 1% of the variability in goal value sharing dimension of teachers' organizational identity. When analyzed in terms of the dimensions of the learning school, team learning, mental models, shared vision and personal mastery dimensions of learning school describes the variability in the goal value sharing dimension of teachers' organizational identity ($p < .05$).

Table 4. Regression level on the dimensions of learning school into the communication dimension of teachers' organizational identity

The independent variable	R^2	F	p	Dimensions of Learning school	β	t	p
Learning school	0.523	100,152	0,000	Team learning	,06	1,22	0,220
				Mental models	,34	6,48	0,000
				Shared vision	,28	4,69	0,000
				Personal mastery	,15	3,18	0,002
The dependent variable: " Communication " dimension of organizational identity.							

$p < .05$

Schools' learning school property describes 52. 3% of the variability in communication dimension of teachers' organizational identity. When analyzed in terms of the dimensions of the learning school, mental models, shared vision and personal mastery dimensions of learning school describes the variability in the communication dimension of teachers' organizational identity significantly, but team learning dimension doesn't describe the variability in the communication dimension of teachers' organizational identity significantly ($p < .05$).

Table 5. Regression level on the dimensions of learning school into the image dimension of teachers' organizational identity

The independent variable	R^2	F	p	Dimensions of Learning school	β	t	p
Learning school	0.525	100,824	0,000	Team learning	,05	1,01	0,310
				Mental models	,35	6,56	0,000
				Shared vision	,30	5,00	0,000
				Personal mastery	,13	2,91	0,004
The dependent variable: " Image " dimension of organizational identity.							

$p < .05$

Schools' learning school property describes 52. 5% of the variability in image dimension of teachers' organizational identity. When analyzed in terms of the dimensions of the learning school, mental models, shared vision and personal mastery dimensions of learning school describes the variability in the image dimension of teachers' organizational identity significantly, but team learning dimension doesn't describe the variability in the image dimension of teachers' organizational identity significantly. According to the results of the study, it is seen that there is a positive significant relationship between identification, goal

value sharing, communication, image dimensions of teachers organizational identity and team learning, mental models, shared vision, personal mastery dimensions of learning school.

The findings of this study determined that schools' learning school property describes 49. 3% of the variability in identification dimension of teachers' organizational identity. . When analyzed in terms of the dimensions of the learning school, team learning, mental models and shared vision dimensions of learning school describes the variability in the identification dimension of teachers' organizational identity, but personal mastery dimension doesn't describe the variability in the identification dimension of teachers' organizational identity. This finding is consistent with the research findings of Nartgün and Demirer (2016), Kuş (2015) and Demircioğlu (2015). The identification dimension of organizational identity is the first step of organizational identity.

Identification is a result of organizational identity as a part of the social identity of the individual (Ashforth and Mael, 1989). Identification is an agreement and integration process in time of the organization's and a person's goals and values. Identification leads members of the organization to accept the proposition of organizational decisions and to act according to their organizational functions (Tompkins and Cheney, 1985), to adopt the organizational behaviors (Shamir, 1990). The employee's adopting and accepting of organizational goals and values represents identification (İnce and Gül, 2005). It is necessary for a school to be a learning organization that teachers should stay longer at school with creating good dialogue individually or in teams. In this process, teachers adopt more of the beliefs and values of the school, therefore, they want to work longer in the same school. As a result, teachers feel emotionally identified themselves with the school (Chan, W. Y., Lau, S., Nie, Y., Lim, S., & Hogan, D., 2008). Therefore, it can be said that the possibility of identification with the learning school teachers working in institutions is higher.

According to result of this study, schools' learning school property describes 56.1% of the variability in goal value sharing dimension of teachers' organizational identity. When analyzed in terms of the dimensions of the learning school, team learning, mental models, shared vision and personal mastery dimensions of learning school describes the variability in the goal value sharing dimension of teachers' organizational identity. These findings are consistent with the research findings of Ayık and Şayir (2015), Doğan and Yiğit (2015) and Kalkan (2015). Common purpose unity is a size that defines how extend the teachers are in cooperation for the common school purposes. The teacher cooperation shows the degreeof being constructive relations in order to improve the school's academic vision further (Gruenert, 2000: cited in Tanriverdi, 2007). Team learning should be developed to create a learning organization (Park and Rojews in 2006). Groups have a greater intelligence by the individual intelligence and team learning is considered as a process that uses this intelligence (Töremen, 2001). So, team learning dominates in thinking and making together in teams (Dinçer, 1992).

According to other results of the study, schools' learning school property describes 52. 3% of the variability in communication dimension of teachers' organizational identity. Team learning dimension of learning school doesn't describe the variability in the image dimension of teachers' organizational identity significantly. In contrast to these findings, cooperation and good relations of teams affect team members' loyalty of staying in teams and their willingness. Hence, the more powerful communication and interaction are within the team, the more desire the team members have solidarity about goals (Eren, 2010).

According to this study, mental models, shared vision and personal mastery dimensions of learning school describes the variability in the communication dimension of teachers' organizational identity significantly. Mental Models are organized long-term feelings, beliefs and behavioral tendencies (Cüceloğlu, 1993). Inquiries should be made, where necessary, to ensure high quality of learning and assumptions that are created in the mind must be replaced (Bayraktaroğlu and Kutanis, 2002). In summary, we perceive the world with our mental models and communicate according to these models. Previously formed mental models are demolished in the learning organizations. Organizations should get rid of models leading to wrong decisions and they should have mental models encouraging more independent thinking (Brestrich, 2000). Individulas learning together in the organization is effective on the demolition of the already formed mental models in the learning organization. In this regard, it can be seen as a natural consequence that there is a positive relationship between communication dimension of organizational identity and the mental models dimension of the learning organization. The personal mastery dimension of learning school refers to the mentality dedicated to continuous improvement and learning. People with a high level of personal mastery are expanding the ability to create real search

results in life (Ataman, 2002). The higher personal mastery skills individuals have, the higher-quality learning the organization have because organizations learn through individuals (Senge, 2002). Therefore, if teachers have effective personal mastery skills in the learning school environment, communication can be achieved in a healthier way within the organization. Teachers can have more powerfull organizational identity perceptionsto their schools in this learning school environment in which communication is effective.

According to the research results obtained, schools' learning school property describes 52. 5% of the variability in image dimension of teachers' organizational identity. Team learning dimension of learning school doesn't describe the variability in the image dimension of teachers' organizational identity significantly. In contrast to these findings, the image of the school is measured by the size of the school, facilities, program quality, the course of the refresh rate content, extracurricular activities, hot friends climate in schools, student behavior, graduates contributions to the school, the quality of education and teachers, home-school cooperation, the state of cooperating with local agencies and school's reputation (Kurşun, 2011, s. 69). Organizational image is all beliefs ,impressions and thoughts that people had about an institution (Taslak and Akın, 2005). Mental models,shared vision and personal mastery dimensions of learning school describes the variability in the image dimension of teachers' organizational identity significantly. In the learning school environments, teachers can contribute in a positive way to the image of their organization by having a common goal and vision, devoting themselves to continuous improvement and learning, changing the model in mind when necessary.

Conclusion

According to the results of this study, there is a positive significant relationship between identification, goal value sharing, communication, image dimensions of teachers organizational identity and team learning, mental models, shared vision, personal mastery dimensions of learning school. At the same time, learning school properties predict teachers' perceptions of organizational identity.

Recommendations

The following suggestions can be developed under this research results:

1. Teachers' perceptions of organizational identity related with what school is, how school is described and remembered can be further reinforced by spreading of learning school environments.
2. When considering the findings about the identification dimension of organizational identity with learning school, in-service training may be given within the scope of creating organizational identity in order to ensure teachers' identification with the goals and values of school.
3. Based on the results related to the image dimension of organizational identity, it can be useful that all upper institutions can make studies about learning organizations for teachers' awareness about the importance of the organization image by transforming schools into learning schools.

References

Albert, S., & Whetten, D. (1985). *Organizational identity*. In L.L. Cummings & B.M. Staw (Eds.), Research in organizational behavior (pp. 263-295). Greenwich, CT: JAI Press.

Ashforth, B.E. & Mael, F. (1989), "Social Identity Theory and the Organizations", *Academy of Management Review*, 14, 20-39.

Ataman, G. (2002). *İşletme yönetimi temel kavramlar ve yeni yaklaşımlar*. İstanbul: Türkmen.

Ayık, A., & Şayir, G. (2015). Investigation of the Relationship between Learning Organization and School Culture according to Perceptions of Teachers1. *Elementary Education Online*, 14(2), 379-394.

Başaran, İ. E. (2000). *Eğitim yönetimi: Nitelikli okul*. Feryal Matbaası, Ankara.

Bayraktaroğlu, S., & Kutanis, R. (2002). Öğrenen kamu örgütlerine doğru. *Kocaeli Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 1, 51-65.

Blackmore, J. (2004). Leading as emotional management work in high risk times: the counterintuitive impulses of performativity and passion, *School Leadership &Management*, 24, 4.

Brestrich, E. T. (2000). *Modernizmden postmodernizme dönüşümcü liderlik*. Ankara: Seba Yayınları.

Cansu, O. C. (2006). *Örgüt Kültürü ile Örgütsel İletişim İlişkisi ve Bir Şirket Uygulaması*. Yayımlanmamış yüksek lisans tezi, Gazi Üniversitesi Sosyal Bilimler Enstitüsü İşletme Anabilim Dalı, Yönetim ve Organizasyon Bilim Dalı, Ankara.

Carpenter, P.S. (2008). *Professional Learning Communities: A case Study of Three Elementary School*, Dissertation, Wilmington University.

Chan, W. Y., Lau, S., Nie, Y., Lim, S., & Hogan, D. (2008). Organizational and personal predictors of teacher commitment: The mediating role of teacher efficacy and identification with school. *American Educational Research Journal*, 45(3), 597-630.

Cüceloğlu, D (1993). *İnsan ve davranışı*. İstanbul: Beta.

Çobanoğlu, F. (2008). *İlköğretim okullarında örgütsel kimlik ve örgütsel etkililik* (Denizli İli Örneği). Yayımlanmamış Doktora Tezi, Hacettepe Üniversitesi, Ankara.

Demircioğlu, E. C. (2015). Karizmatik Liderliğin Yönetsel Açıdan Değerlendirilmesi. *Uluslararası Akademik Yönetim Bilimleri Dergisi*, 1 (1), 52-69.

Dinçer,Ö. (1992).*Örgütgeliştirme:teori, uygulama ve teknikler*.İstanbul:Timaş.

Doğan, S., & Yiğit, Y. (2015). Öğreten Okulların Tamamlayıcısı: Öğrenen Okullar. *Elektronik Sosyal Bilimler Dergisi*, 14(53), 318-336.

Dutton, J. & Dukerich, J. M. (1991). Keeping an eye on the mirror: Image and identity in organizational adaptation, *Academy of Management Journal*, 34, 517-554.

Eren, E. 2010. *Örgütsel Davranış ve Yönetim Psikolojisi*. İstanbul: Beta Yayınları 12. Baskı.

Ertürk, A. (2003). Örgütsel iletişim ve adalet algılarının örgütsel kimlik algısı üzerindeki etkileri. *Yönetim Araştırmaları Dergisi*, 2, 147-170.

Foreman, P., Whetten, D. A. (2002). Members' identification with multiple-identity organizations, *Organization Science*, 13(6), 618-635.

Hatch, M.J., & Schultz, M. (1997). Relation Between Organizational Culture, Identity and Image, *European Journal of Marketing*, 3185/6), s.356-65.

Hündür, B. (2006). Örgütsel İmaj ve Üye Bütünleşmesi I. http://www.ikademi.com/orgutseldavranis/1118- orgutsel-imaj-ve-uye-butunlesmesi.html, Erişim tarihi: 10.06.2016).

İnce, M. & Gül, H. (2005). *Yönetimde Yeni Bir Paradigma: Örgütsel Bağlılık*, Konya: Çizgi Yayıncılık. Keser, 2005.

İstar, N. (2006). *Öğrenen organizasyonlarda başarı kriterleri ve bir uygulama*. Yayımlanmamış yüksek lisans tezi. Yıldız Teknik Üniversitesi, İstanbul.

Jokıć, S., Ćosıc, L., Sajfert, Z., Pečujlıja, M., Pardanjac, M. (2012). Schools as learning organizations: Empirical Study In Serbia. *Metalurgıa Internatıonal*, 17(2), 83-89.

Kalkan, F. (2015). İlköğretim Okulu Öğretmenlerinin Mesleki Öğrenme Topluluğu Algılarının Bazı Değişkenler Açısından İncelenmesi. *Electronic Turkish Studies*, 10(11).

Kurşun, A. T. (2011). *Okulların kurumsal imajının okul yöneticilerinin etik liderlik özellikleri ve bazı değişkenler açısından incelenmesi*. Yüksek Lisans Tezi. Selçuk Üniversitesi.

Kuş, H. H. (2015). İlköğretim okullarında çalışmakta olan öğretmenlerin örgütsel bağlılık ile yaşam doyum düzeyleri arasındaki ilişki.

Nartgün, Ş. S., & Demirer, S. (2016). Öğretmenlerin Örgütsel Sosyalleşme ve Özdeşleşme Düzeyleri ile Birlikte Çalışma Yeterlikleri Arasındaki İlişki. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi*, 16(1).

Özus, E. (2005). MEB Bağlı Konya İlindeki Mesleki ve Teknik Orta Öğretim Kurumlarında Çalışan Öğretmen ve Yöneticilerin Öğrenen Organizasyonu Algılamaları. *Selçuk Üniversitesi*, Konya.

Park, J. H., & Rojewski, J. (2006). The learning organization model across vocational and academic teacher groups. *Career and Technical Education Research*, 31(1), 23-48.

Senge, P. (2002). *Beşinci disiplin*. 9. Basım. çev. A. İldeniz ve A. Doğukan. İstanbul: Yapı Kredi.

Shamır, B. 1990 "Calculations, values and Identities: The Sources of Collectivist Work Motivation", *Human Relations*, 43, 313-332.

Skalen, P. (2004). New public management reform and the construction of organizational identities, *The International Journal of Public Sector Management*,vol.17, no.3, s.251-263

Tanrıverdi, S. (2007). *Katılımcı okul kültürünün yabancı dil öğretmenlerinin iş motivasyonuyla ilişkisine yönelik örnek bir çalışma*. Yayımlanmamış yüksek lisans tezi. Yeditepe Üniversitesi, İstanbul.

Taslak, S., & Akın, M. (2005) Örgüt İmajı üzerinde Etkili Olan Faktörlere Yönelik Bir Araştırma: Yozgat İli Emniyet Müdürlüğü Örneği. *Erciyes Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 19(2), 263-294.

Taşdan, M. (2013). İlköğretim okullarında örgütsel kimlik algısı ölçeğinin geliştirilmesi. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi*, 46(2), 1-24.

Tompkins, P. K., & Cheney, G. (1985). Communication and unobtrusive control in contemporary organizations. Organizational communication: Traditional themes and new directions, 13, 179-210.

Toremen, F. , 2001, *Oğrenen Okul*, Nobel Yayın Dağıtım Yayın No: 203, Ankara.

Tüzün, İ. K. (2006). *Örgütsel Güven, Örgütsel Kimlik ve Örgütsel Özdeşleşme İlişkisi; Uygulamalı Bir Çalışma*. Yayımlanmamış doktora tezi. Gazi Üniversitesi Sosyal Bilimler Enstitüsü işletme Anabilim Dalı: Ankara.

Tüzün, İ.K. & Çağlar İ. (2008). Örgütsel Özdeşleşme Kavramı ve İletişim Etkinliği İlişkisi. *E Journal of Yaşar Universitiy*, Vol : 9, Num:2, pp. 1-13.

Uğurlu, C.T., Doğan, S. & Yiğit, Y. (2014). Öğrenen okul ölçeği geçerlik ve güvenirlik çalışması. *Türk Eğitim Bilimleri Dergisi*, 12(1), 35-45.

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Today's College Students: Who Are They and What Do They Require from a College Education?

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Abstract

College students today are not like students from just a decade before. The purpose of this archival quantitative, data mining study using data from the Integrated Postsecondary Education Data System (IPEDS) of the National Center for Education Statistics was to identify the demographics of today's college students in the United States during the Fall of 2014. This study was significant because understanding who these students are and what they need from college is critical for providing them with an education to become tomorrow's leaders. Findings revealed that the majority of students tended to be under the age of 25; female; full-time; enrolled in face-to-face courses; and White. They tended to enroll in public 2-year and 4-year colleges. These female, full-time, White students attending face-to-face classes also tended to be stressed, stay in college longer, are not doing what they need to do to learn, are technologically proficient, are unprepared for college, are connected to family and friends, desire classes that are technologically-rich, are skilled in conducting searches on Google and Wikipedia but not in conducting academic research, enjoy some risk in the classroom, and are more diverse than past students.

Key words: College students, Graduation rates, Motivating college students.

Introduction

Who are the college students of today? Levine and Cureton (1998) suggested that the major change in the academy in recent years is the students. Less than 17% of college students today are traditional students, classified as between the ages of 18 and 22, full-time, and residing on campus. Today's college students are older, more diverse, influenced in the past by various political and social experiences, focused more on professional careers while in need of academic remediation, more in need of psychological assistance, and interact with others differently than previous college students.

What do today's college students want from an education? Levine and Cureton (1998) claimed that education is not as important to today's college students as it was to prior student cohorts. A college education has become just one more activity for students to juggle each day. Today's students want their colleges close by and classes that are offered when it is convenient for them. They want parking that is handy; they do not want to have to wait in lines; and they want to deal with courteous, cooperative, and competent employees. They expect colleges to run customer services like other businesses run their customer services. Their attention is on ease, value, assistance, and price. They do not trust the nation's influential or the societal organizations. They perceive that there are challenges everywhere. Furthermore, they have decided that they cannot ignore these challenges. Essentially, today's college students are not happy that they will have to resolve these challenges which they did not create.

What are the graduation rates of college students today? The 2013 graduation rate for first-time (a student who has no prior postsecondary experience), full-time undergraduate students who began earning a bachelor's degree at a 4-year degree-granting institution in the fall of 2007 was 59%. In other words, 59% of all first-time, full-time students who began earning a bachelor's degree at a 4-year institution in the fall of 2007 completed the degree at that institution by the year 2013 (U.S. Department of Education, 2015).

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While first-time, full-time undergraduate students who began to earn a bachelor's degree at a 4-year degree-granting institution in the fall of 2007, the 6-year graduation rate was 58% at public institutions, 65% at private nonprofit institutions, and 32% at private for-profit institutions. The 6-year graduation rate was 56% for males while 62% for females; the graduation rate was higher for females than for males at both public (60% vs. 55%) and private nonprofit institutions (68% vs. 62%). However, males had a higher graduation rate than females (36% vs. 28%) at private for-profit institutions (U.S. Department of Education, 2015).

Six-year graduation rates for first-time, full-time students who began earning a bachelor's degree in the fall 2007 differed according to institutions' level of selectivity. Graduation rates were highest at postsecondary degree-granting institutions that had the lowest admissions acceptance rates. While graduation rates were the lowest at institutions that had open admissions policies. For example, at 4-year institutions with open admissions policies, 34% of the students completed a bachelor's degree within 6 years. At 4-year institutions where the acceptance rate was less than 25% of applicants, the 6-year graduation rate was 89% (U.S. Department of Education, 2015).

As college students deliberately stay in college postponing graduation, colleges strive to improve their 4-year graduation rates. During the summer of 2009 President Obama reacted to the idea that college achievement was crucial for the United States to be able acquire international economic control. Obama introduced the American Graduation Initiative. This initiative requested that the college graduation rate be increased to 60% by the year 2020. This achievement would regain the United States' position of having the most citizens with college degrees. Consequently, a great deal of the colleges invested revenue on improving college graduation rates (Chen, & Yur-Austin, 2016).

The purpose of this paper was to identify the demographics of today's college students. This study is significant because understanding who these students are and what they desire and require from college is critical for higher education. Colleges have the duty to the society it serves to make education available for students to be in the best position to lead in the future. It is important to know who they are and what they desire and require from higher education in order to be able to provide them with an appropriate college education to meet their needs and wants. Furthermore, facilitating and encouraging students to step up and take their own initiatives is essential for student learning and ultimate college success. Identifying who these students are is the first step in addressing how to prepare them for the future.

A review of the literature presents a compilation of research, peer-reviewed journals, non-peer reviewed journals, books, and online sources on today's college students. The academic databases used were from the online library of Texas A&M University-Commerce and included, but were not limited to, Academic Search Premier, EBSCO, Education Research Complete, Eric, ProQuest, and Sage Publications. The key descriptive terms used for this research were college students, college students today, college student graduation rates, and motivating college students.

A Review of the Literature

Has the push on college admission numbers meant that college students are getting more intelligent? On the contrary, Kline (2015) claimed that American students are performing at or below students globally. She further claimed that student academic performance has declined during the past 10 years. Kline questioned the engagement of these more intelligent students and why they seldom come to their professors' offices to ask for help with the course or with exams. In addition, she found that students take very little advantage of online resources available to them from the course textbook publishers or spend nominal time in online courses. There is a perceived lack of motivation in today's college students (TCS). Kline maintained that it is too early to become disheartened and it may be that students today are experiencing too much of a good thing in technology.

Technology and College Student Today

College students today are not like students from just a decade before due to technology. Students have never had the opportunities for selecting course material as they do currently (Robinson & Stubberud, 2012b). TCS are more technologically advanced (Brunner, Wallace, Reymann, Sellers, & McCabe, 2014; Crone & MacKay, 2007; McCoy, 2010; Ratliff, 2011; Robinson & Stubberud, 2012a; Robinson & Stubberud, 2012b; Russo, Fallon, Zhang, & Acevedo, 2014; Speaker, 2004) and are therefore more able to take online courses then students of the past, according to McCormack (2015). For these students (18–25) the Internet, Game Boys, smart phones, tablets, I-pads, Play Stations, and MP3 players (McCoy, 2010; Robinson & Stubberud, 2012b)

have been are part of their everyday lives. Moreover, technology has been incorporated into higher education. "Electronic mail, instant messages, chat, discussion boards, podcasts, Wimba, and web-based course management software" (McCoy, 2010, para. 1) are standard features of college online and blended classes.

Textbooks, whether electronic or not, are not TCS preferred method of learning, as maintained by Robinson and Stubberud (2012a). However, students save money by buying ebooks in place of textbooks and they will buy ebooks even if textbooks are required. A problem with ebooks is that professors may not allow the use of ebooks in class, which stops students from reading and replying to email and other social media communications. TCS tend to prefer notes posted in the cloud more (Robinson & Stubberud, 2012b) than the other available choices of educational devices for the classroom. They prefer notes because professors can make them available for the students to follow during lectures. Being able to follow along provides opportunities for making comments directly in the documents as the professor is speaking.

TCS expect to be entertained during the educational process (Robinson, 2013) because technology has become an integral part of the world in which they live (Crone & MacKay, 2007; Robinson & Stubberud, 2012a; Robinson & Stubberud, 2012b; Russo et al., 2004). Consequently, long lectures and Powerpoint presentations do not hold their attention (Crone & MacKay, 2007). They consider the time-honored classroom as humdrum (Robinson, 2013). They count on college faculty and administrators to communicate in a similar manner as students communicate in other areas of their lives (Ratliff, 2011; Speaker, 2004). They want to be linked continually, updated instantly, and are particular about how they reply. They are particular because there are many options available to them (Ratliff, 2011). They are technologically sophisticated and needy. Their social interactions are often digital communications. TCS are the virtual students. Social media permits them to locate others with similar pursuits, morals, and histories and to connect wherever and whenever (Brunner et al., 2014; Robinson & Stubberud, 2012a; Robinson & Stubberud, 2012b). TCS want to feel connected at all times (Russo et al., 2014).

Even though there has been much progress with the use of technology in the classroom (Kline, 2013; Speaker, 2004), Speaker (2004) claimed that professors lack the necessary training needed to be able to utilize these educational technologies effectively. Students have claimed that they do learn better when professors use these devices during class, as maintained by Speaker. TCS are much more advanced in the use of these technologies than the instructors who are educating them. Professors are encouraged to get the necessary training in educational technologies to be able to take advantage of these teaching devices. Professors are also encouraged to publish in course syllabi that these educational technologies are being used in the course.

The level of skill in the use of technology of TCS is a central element to take into account when developing technology-rich courses (Crone & MacKay, 2007; Robinson & Stubberud, 2012a; Russo et al., 2014). While this may be the age of the virtual students, McCoy (2010) cautioned course designers about making the mistake of thinking all students enrolled in a course are technologically savvy. Educators may take for granted that all students between the ages 18 and 25 are knowledgeable about all technology. This assumption may or may not be accurate. A student's family financial standing, the quality of earlier education, and the family structure has an impact and factors into whether or not a student has access to computers. Moreover, a student's family financial standing, the quality of earlier education, and the family structure also has an impact and factors into one's opinion of one's ability and level or proficiency with technology.

The preferences of TCS should also be considered when developing technology-rich courses. Different students have different preferences. Robinson and Stubberud (2012a; 2012b) deduced that course designers should consider students' preferences and respond accordingly when requiring various devices for courses and coursework. Robinson and Stubberud (2012a; 2012b) emphasized that it is the responsibility of the professor to ascertain how to best serve the students enrolling in his or her courses.

TCS, often referred to as the Millennial Generation (Ratliff, 2011; Robinson, 2013; Russo et al., 2014), are losing the art of eye contact. They indefatigably check with "their phone for updates, text messages, emails, Facebook posts, and Twitter tweets" (Ratliff, 2011, p.68). At the same time faculty wrestle with pinpointing how these "digital students" (p.68) learn, higher education professionals wrestle with pinpointing effective means for interacting with them. According to Ratliff, there is little research on social media success in the academy even though many college professors are using technology to communicate with their student. While research is plentiful on classroom social media practices, this research does not present as much data by comparison to the research conducted on faculty communication with colleagues.

Utilizing social media to connect with TCS is to be expected, as maintained by Ratliff (2011). In order to communicate effectively with these students, college professors must incorporate innovative ways to utilize technology, research options to employ social media, and design strategies that regularly utilize what is trending to accommodate the shifting requirements of the students colleges serve. Research confirmed that TCS are on the Internet, connected, and want to be linked to their institutions. TCS are paying attention.

Kline (2015) posed the question of whether or not technology is an asset or a liability for TCS. One the one hand, technology does make communication simple as well as offering an abundance of resources at one's fingertips. On the other hand, could technology be too much of an interruption? Does it offer a phony perception of self-confidence because students think that they can Google something later if needed? Kline claimed that the harmful effects of technology are prevailing over the helpful effects it provides. Students are less engaged, appear to be more diverted, and are busier than just 10 years ago. Technology seems to be impeding learning and classroom productivity for students, as maintained by Kline.

College Students Today

TCS are not doing what is necessary for them to learn (Kline, 2013). Some students are uncertain about the concepts learned in the classroom. They are also uncertain when asked a question even if the answer is written on the board. Their quality of learning and wanting to learn appear to be on the decline. They prefer to take a photo on their phones of the information on the white board instead of taking notes in class and asking questions during class. They do not appear to realize that learning occurs because of taking notes and also facilitates engagement as well. It appears that TCS do not want to ask questions or to spend time meeting with professors outside of the classroom.

Head and Eisenberg (2009) claimed that TCS tend to be troubled, puzzled, and irritated with conducting research and information literacy assignments. These reactions occur in spite of the easiness, handiness, and pervasiveness of the Internet. Students' reactions to conducting research and information literacy assignments include feelings of being overburdened with all the burgeoning resources available to them to search through. Students have specific problems negotiating the information highway. They have, for example, difficulty locating sources they need, are certain are available, and want immediately. Head and Eisenberg concluded that TCS are not trained in conducting academic searches.

However, McCormack (2015) pointed out that TCS conduct research on a daily basis on their devices through Internet searches. McCormack also pointed out that they only need to (a) learn to look critically at the Web for credibility and (b) evaluate sources thoroughly. They typically conduct research using Google. Accordingly, Wikipedia is has become a trendy reference resource. TCS are not conscious of questions regarding reliability and credibility linked with using Wikipedia, other than words of warning from professors who alert them to avoid using Wikipedia for academic research papers (Jennings, 2008).

Lawrence (2015) suggested that TCS have varied approaches for evaluating search results. Their approaches are established from their previous practices with Google and Wikipedia. Therefore, they developed confidence and habits from these previous practices. Professors are encouraged to take them where they are and augment their experiences with more accepted academic skills for research beyond Google and Wikipedia (Jennings, 2008; Lawrence, 2015). That is, if they would like them to become information literate in the information age. Professors are also encouraged to consider Wikipedia as a teaching tool for critical thinkers and lifelong learners who utilize all available information resources (Jennings, 2008).

The increased pressure on university admission numbers suggests that TCS are brighter. However, the ability of these students to stay focused has declined. This decline in focus is in spite of how easy it is to attain information. They do not appear to be as conscious of what is going on around them as prior students were. There is a lack of attention to local, national, and international news even though that they have multiple devices at their fingertips. Moreover, many of these students do not appear to think that what is going on around them locally, nationally, and internationally is important to them. They appear to be more attentive to what is on social media (Kline, 2013).

TCS have been compared to "Peter Pan" (Harden, 2013, p. 257). They are not interested in rushing into adulthood or taking responsibility for themselves. They are staying in school longer, taking longer to become self-supporting, and waiting longer to say "I do" and have children. Harden claimed that it is not easy to differentiate between "cause and effect" (p.257). Harden asked if students today are staying in college longer to

delay getting married or do they delay getting married because they need more time to complete their education? Furthermore, the college "hook-up culture" (p. 257) has provided the means for students to be sexually active while avoiding having to grow up and become responsible citizens. As a result, Harden claimed that the new Neverland is college.

TCS have experienced greater amounts of adult supervision. Consequently, they are as a group conservative, obedient, cooperative, and team players. These students have been brought up to think of themselves as "special" (Brunner et al., 2014, p. 262). They are self-assured, accomplished, active, intelligent, and motivated. They score higher on standardized aptitude tests, are efficient at handling multiple endeavors, and do well with educational interaction. They need organization and constructive comments on how they are doing, are results oriented, want to know what is expected, and would like to be evaluated on what they achieved.

This focus on achievement, obedience, and the value of friendships appears to have resulted in their being more "stressed-out" (Brunner et al., 2014, p. 262). As a result, the number of students taking advantage of college counseling services is growing (Levine & Cureton, 1998; Watkins, Hunt, & Eisenberg, 2012). Although TCS experience greater stress, they continue to report a high degree of satisfaction with their college experience. Research further indicates that the psychological health of these students is on the decline. The number of students today that are contacting counseling services is escalating from students in the past (Watkins et al.).

Career counselors are encouraged to try to modify student thinking toward making employment decisions that are more career-connected than accepting employment based on convenience and higher compensation. Research has suggested that job satisfaction improves as students obtain work that more closely aligns with their career goals. Employees tend to be satisfied when they have employment that supports their career objectives, which also offers them intrinsic happiness. Career counselors are further encouraged to suggest to students to search for work that will enhance their career development and present opportunities of assorted work related experiences, even though these jobs may pay lower salaries (Larkin, 2007).

TCS are risk-takers. Classroom activities that offer chances for instant responses and student participation are effective for learning. A majority of these students require shared, lively, and student-centered activities. These students have grown up with game shows on television, interactive video games, and the Internet. Game shows, interactive video games, and the Internet are all forms of entertainment as well as educational. Accordingly, TCS count on education being entertaining. They will stop concentrating if the learning activity does not entertain them. In contrast however, they will invest time and effort to learn a new game or technological device (Robinson, 2013).

TCS is a new cohort of students with different hopes and dreams from past cohorts. They have difficulty focusing in class when passively receiving information; on the other hand, they are easily engaged during shared, lively, and student-centered activities. This is particularly true in a shared learning activity. Professors have long utilized games for engaging students in the classroom. Games are effective activities for engaging students due to the mild stress that these learning activities produce. Research has indicated that men particularly enjoy the risk that games provide. Research as suggested that students desire a 25-50% risk factor. As follows, learning games that are well-designed can be effective activities to accomplish the objectives of the professor and the preferences of the students (Robinson, 2013).

Traditional college students are defined as those who have earned a high school diploma, enroll in college full-time immediately after earning their high school diploma, depend on parents for financial support, and work part-time. These traditional students make up a just under 30% of the current student body (Larkin, 2007). TCS are more ethnically diverse then student of past years, as maintained by Brunner et al. (2014). They are also not as concerned with race and ethnicity as past students were. Incidentally, minority women are breaking new ground by achieving more academic attainment than men and make up the majority of TCS.

Motivating College Students Today

Motivating college students to learn is fundamental for professors teaching in higher education. Motivation is also fundamental for learning. Even though motivation is fundamental for learning, motivating college students to learn is not clear-cut or simple. There are numerous aspects impacting students and student learning (Halawah, 2011). To begin with, TCS grew up in an era of "convenience and consumption" (Crone & MacKay, 2007, p. 18). A college education has become commercialized and thought of by these students just as one more of many achievements to be completed, instead of thinking of it as an opportunity in life to become engrossed in

and with the process of growth. Students in college are encouraged to become deliberate designers of their own education. They are encouraged to establish ambitions, to investigate, to contemplate, and to synthesize attained learning with enthusiasm for making the most of living in today's world.

Revering the strength of the need for connections of TCS with their parents is essential for preserving their enthusiasm for earning a college education. They seem to be the receivers of large amounts of parental interest. This parental interest persists during the college years. These students tend to carry on regular communications with their parents and other members of their families by means of texting, emailing, and phone calling to keep informed or to ask for advice on insignificant matters. Students are more in search of individuals that can provide organization, guidance, and approval than students were in the past, as maintained by Crone and MacKay (2007). Flanagan, (2015) stated that "the infantilization" (p.56) of college students today whose "whims and afectations [*sic*] … must be constantly supported and championed" (p. 56). Halawah (2011) claimed that as students experience connection and support, they will be internally motivated to participate in class activities.

As a result, TCS frequently inquire of others about what they need to do rather than considering what they should by themselves. Crone and MacKay (2007) indicated that it appears as though these students prefer work to be organized for them or even completed. With the work previously organized or completed, they are able to proceed on to the next thing. Crone and MacKay alleged that a more effective approach for advising students would be to ask questions of them. By asking questions, students have to think through their answers and come up with their own responses to the questions. By answering questions and coming up the answers, the educational experience becomes theirs allowing them to own the process. This question and answer approach also encourages engagement, which leads to motivation. Spoon feeding them information will not produce the same motivational results.

Dynamic learning activities that are linked to the real world and where students are dealt with as scholars and achievers enhance motivation for learning (Halawah, 2011). Experiential learning is a specifically effective method of learning for TCS. Experiential learning tends to show evidence of understanding toward concerns of society. This may be due to 9/11 and other tragedies that these students have been exposed to during their lives. College activities that engage students and require them to relate their education to their everyday lives are more apt to hold their attention. Moreover, assisting students with the realization of how a college education is meaningful to their daily existence is imperative, as asserted by Crone and MacKay (2007).

Professors should be in the role of facilitating and encouraging students to step up and take their own initiative, which ultimately leads to student success and learning. In order to do this effectively, colleges must first know who these students are. Once it is determined who TCS are, college professors and administrators will be able to address their needs in order to inspire them to become independent adult learners who own their education and are prepared to become tomorrow's leaders (Crone & MacKay, 2007).

In conclusion, Levine and Cureton (1998) alleged that colleges have the duty to provide an education for TCS so that they will be able reach their potential and to be in the best positions to lead in the future. The college curriculum must include teaching optimism, accountability, acceptance of diversity, and confidence in one's self. Through ongoing encouragement, the behaviors of optimism, accountability, acceptance of diversity, and confidence in one's self could give power to these students that can be handed down to future cohorts.

In summary, professors are encouraged to (a) be knowledgeable in technology; (b) consider their students technological preferences and skill-levels when designing technology-rich classes; (c) incorporate innovative ways to utilize technology; (d) keep in mind that students today are conducting research on a daily basis on their devices through Internet searches; (d) teach students to look critically at and evaluate sources on the Web for credibility and reliability; (e) take these students where they are and augment their experiences with more accepted academic skills for conducting research beyond Google and Wikipedia; (f) remember that students need organization and constructive comments on how they are doing, are results oriented, want to know what is expected of them, and want to be evaluated on their achievements; (g) facilitate thought processes toward career-connected decisions that enhance career development; (h) bear in mind that activities that offer chances for instant responses and student participation are effective for learning; (i) consider games as effective activities for engaging students due to the mild stress that these games produce; (j) respect their need for connection; (k) ask questions of them to offer opportunities for ownership of their own education; and (l) link learning activities to the real world. These are suggestions from the review of the literature for professors to consider when teaching TCS for becoming tomorrow's leaders.

Method

This research study was an archival quantitative, data mining study using data from the Integrated Postsecondary Education Data System (IPEDS) of the National Center for Education Statistics (National Center for Education Statistics, 2014). IPEDS is a system of interrelated surveys compiled each year by the National Center for Education Statistics. IPEDS gathers information from colleges, universities, and technical and vocational institutions that are involved in federal student financial aid programs. The Higher Education Act of 1965, as amended, requires institutions that are involved in federal student aid programs to submit data on enrollment, program completion, graduation rates, faculty and staff, finances, institutional prices, and student financial aid (The Higher Education Act of 1965). These data are made available to the public through the IPEDS Data Center.

This study identified the demographics of undergraduate enrollments during the Fall of 2014 according to available demographic data at public, private, and for-profit 2-year and 4-year or above universities in the United States. Data were extracted according to institution type in public, private, and for-profit 2-year and 4-year or above universities in the United States. The data were downloaded from IPEDS and converted into an Excel document. The Excel document was formatted and cleaned up.

Results and Discussion

The findings revealed the following information shown in Table 1 about Fall 2014 undergraduate enrollment demographics of students from public, private, and for-profit 2-year and 4-year or above universities in the United States. Of the undergraduate students enrolled during the Fall of 2014 in 1618 colleges in the United States, 72% were under the age of 25 while 28% were age 25 and older; 44% were male students while 56% were female students; 59% were full-time while 41% were part-time; and 9% were only enrolled in distance education courses, 18% were enrolled in some distance education courses, and 73% were not enrolled in any distance education courses.

Table 1. *Fall 2014 Undergraduate Enrollment by Age, Gender Attendance, and Distance Education*

Variable	N	Sum	Minimum	Maximum	Mean	Median
Grand total - Age under 25	1,618	8,751,150	4	50,427	5,408	3,165
Grand total - Age 25 and over	1,618	3,375,365	10	40,658	2,086	1,153
Total men - Age under 25	1,618	3,995,701	1	23,198	2,4ZZ69	1,353
Total men - Age 25 and over	1,618	1,387,019	5	16,021	857	449
Total women - Age under 25	1,618	4,755,449	1	28,783	2,939	1,747
Total women - Age 25 and over	1,618	1,988,346	3	25,315	1,228	671
Full time total - Age under 25	1,618	6,067,373	1	41,035	3,749	1,858
Full time total - Age 25 and over	1,618	1,115,859	1	11,808	689	433
Part time total - Age under 25	1,618	2,683,777	1	32,309	1,658	768
Part time total - Age 25 and over total	1,618	2,259,506	1	29,981	1,396	627
Students enrolled only in distance education courses	1,618	1,134,071	1	40,338	700	279
Students enrolled in some distance education courses	1,618	2,152,946	1	21,982	1,330	748
Student not enrolled in distance education courses	1,618	8,849,013	4	56,873	5,469	3,191

The findings also revealed the following information shown in Table 2 about Fall 2014 undergraduate enrollment demographics of students from public, private, and for-profit 2-year and 4-year or above universities in the United States. Of the undergraduate students enrolled during the Fall of 2014 in 1618 colleges in the United States, less than 1% were American Indian or Alaska Native students, less than 1% were Asian students, 12% were Black or African American students, 19% were Hispanic students, less than 1% were Native Hawaiian or Other Pacific Islander, 53% were White students, 3% were two or more races, 4 % were listed as race/ethnicity is unknown, and 3% were listed as nonresident alien.

Table 2. *Fall 2014 Undergraduate Enrollment by Race*

Variable	N	Sum	Minimum	Maximum	Mean	Median
Grand total	1,618	12,136,030	24	91,179	7,500	4,594
American Indian or Alaska Native	1,618	84,967		2,659	52	19
Asian	1,618	713,540		9,464	441	81
Black or African American	1,618	1,439,913		18,520	889	341
Hispanic	1,618	2,247,838		44,870	1,389	339
Native Hawaiian or Other Pacific Islander	1,618	35,944		1,804	22	6
White total	1,618	6,379,565		61,498	3,942	2,416
Two or more races	1,618	372,044		3,489	229	97
Race/ethnicity unknown	1,618	502,615		18,469	310	118
Nonresident alien	1,618	359,604		5,359	222	42

The findings further revealed the following information shown in Table 3 about Fall 2014 undergraduate enrollment demographics of students from private, 2-year universities in the United States according to age, gender, and attendance level. Of 13,568 undergraduate students enrolled during the Fall of 2014 in 37 colleges in the United States 65% were under the age of 25 while 34% were age 25 and older, 39% were male students while 61% were female students, and 74% were full-time students while 26% were part-time students.

Table 3. *Fall 2014 Undergraduate Enrollment by Private 2-year Institution Type, Age, Gender, and Attendance*

Variable	N	Sum	Minimum	Maximum	Mean	Median
Grand total - Age under 25	37	8,756	5	1,502	236	85
Grand total - Age 25 and over	37	4,812	1	881	130	64
Total men - Age under 25	37	3,982		891	107	22
Total men - Age 25 and over	37	1,366		273	36	14
Total women - Age under 25	37	4,774	1	611	129	42
Total women - Age 25 and over	37	3,446		743	93	41
Full time total - Age under 25	37	7,181	5	1,065	194	51
Full time total - Age 25 and over	37	2,864	1	495	77	35
Full time men - Age under 25	37	3,377		630	91	17
Full time men - Age 25 and over	37	877		137	23	10
Full time women - Age under 25	37	3,804	1	435	102	34
Full time women , Age 25 and over	37	1,987		405	53	18
Part time total - Age under 25	37	1,575		437	42	2
Part time total - Age 25 and over	37	1,948		386	52	1
Part time men - Age under 25	37	605		261	16	1
Part time men - Age 25 and over	37	489		136	13	0
Part time women - Age under 25	37	970		176	26	0
Part time women - Age 25 and over	37	1,459		338	39	1

In addition, the findings revealed the following information shown in Table 4 about Fall 2014 undergraduate enrollment demographics of college students from for-profit, 2-year universities in the United States according to age, gender, and attendance level. Of 96,163 undergraduate students enrolled during the Fall of 2014 in 254 colleges in the United States 51% were under the age of 25 while 49% were age 25 and older, 36% were male students while 64% were female students, and 90% were full-time students while 10% were part-time students.

Table 4. *Fall 2014 Undergraduate Enrollment by For-Profit 2-year Institution Type, Age, Gender, and Attendance*

Variable	N	Sum	Minimum	Maximum	Mean	Median
Grand total - Age under 25	254	48,837	1	2,439	192	133
Grand total - Age 25 and over	254	47,326	3	2,181	186	142
Total men - Age under 25	254	17,044		1,473	67	23
Total men - Age 25 and over	254	17,375		998	68	32
Total women - Age under 25	254	31,793		1,272	125	96
Total women - Age 25 and over	254	29,951		1,621	117	74
Full time total - Age under 25	254	45,248		2,286	178	115
Full time total - Age 25 and over	254	40,923	3	1,986	161	122
Full time men - Age under 25	254	16,136		1,473	63	18
Full time men - Age 25 and over	254	15,781		850	62	27
Full time women - Age under 25	254	29,112		1,173	114	85
Full time women - Age 25 and over	254	25,142		1,467	98	62
Part time total - Age under 25	254	3,589		153	14	0
Part time total - Age 25 and over	254	6,403		371	25	0
Part time men - Age under 25	254	908		90	3	0
Part time men - Age 25 and over	254	1,594		148	6	0
Part time women - Age under 25	254	2,681		121	10	0
Part time women - Age 25 and over	254	4,809		333	18	0

Additionally, the findings revealed the following information shown in Table 5 about Fall 2014 undergraduate enrollment demographics of students from public, 2-year universities in the United States according to age, gender, and attendance level. Of 5,235,483 undergraduate students enrolled during the Fall of 2014 in 687 colleges in the United States 63% were under the
age of 25 while 37% were age 25 and older, 44% were male students while 56% were female students, and 37% were full-time students while 63% were part-time students.

Table 5. *Fall 2014 Undergraduate Enrollment by Public 2-year Institution Type, Age, Gender, and Attendance*

Variable	N	Sum	Minimum	Maximum	Mean	Median
Grand total - Age under 25	687	3,321,723	20	50,427	4,835	3,303
Grand total - Age 25 and over	687	1,913,760	5	40,658	2,785	1,804
Total men - Age under 25	687	1,532,578	7	21,644	2,230	1,435
Total men - Age 25 and over	687	764,877	3	16,021	1,113	659
Total women - Age under 25	687	1,789,145		28,783	2,604	1,822
Total women - Age 25 and over	687	1,148,883	1	24,637	1,672	1,115
Full time total - Age under 25	687	1,461,583		18,118	2,127	1,474
Full time total - Age 25 and over	687	474,188		10,677	690	494
Full time men - Age under 25	687	695,160		7,832	1,011	667
Full time men - Age 25 and over	687	204,591		4,142	297	199
Full time women - Age under 25	687	766,423		10,286	1,115	789
Full time women - Age 25 and over	687	269,597		6,535	392	283
Part time total - Age under 25	687	1,860,140		32,309	2,707	1,730
Part time total - Age 25 and over	687	1,439,572		29,981	2,095	1,307
Part time men - Age under 25	687	837,418		13,812	1,218	737
Part time men - Age 25 and over	687	560,286		11,879	815	449
Part time women - Age under 25	687	1,022,722		18,497	1,488	991
Part time women - Age 25 and over (14)	687	879,286		18,102	1,279	795

As well, the findings revealed the following information shown in Table 6 about Fall 2014 undergraduate enrollment demographics of students from private, 4-year universities in the United States according to age, gender, and attendance level. Of 1,731,180 undergraduate students enrolled during the Fall of 2014 in 631 colleges in the United States 79% were under the age of students 25 while 21% were age 25 and older, 44% were male students while 56% were female students, and 83% were full-time students while 17% were part-time students.

Table 6. *Fall 2014 Undergraduate Enrollment by Private 4-year Institution Type, Age, Gender, and Attendance*

Variable	N	Sum	Minimum	Maximum	Mean	Median
Grand total - Age under 25	631	1,361,571	4	23,829	2,157	1,470
Grand total - Age 25 and over	628	369,609	2	40,966	588	192
Total men - Age under 25	631	604,431		12,335	957	620
Total men - Age 25 and over	628	151,295		16,587	240	66
Total women - Age under 25	631	757,140		13,342	1,199	823
Total women - Age 25 and over	628	218,314		24,379	347	108
Full time total - Age under 25	631	1,263,111		22,889	2,001	1,346
Full time total - Age 25 and over	628	179,607		40,966	285	89
Full time men - Age under 25	631	563,085		11,544	892	572
Full time men - Age 25 and over	628	76,567		16,587	121	35
Full time women - Age under 25	631	700,026		12,953	1,109	753
Full time women - Age 25 and over	628	103,040		24,379	164	45
Part time total - Age under 25	631	98,460		4,844	156	55
Part time total - Age 25 and over	628	190,002		35,454	302	66
Part time men - Age under 25	631	41,346		2,030	65	21
Part time men - Age 25 and over	628	74,728		16,193	118	21
Part time women - Age under 25	631	57,114		2,814	90	32
Part time women - Age 25 and over	628	115,274		19,261	183	42

The findings revealed too that the following information shown in Table 7 about Fall 2014 undergraduate enrollment demographics of students from for-profit, 4-year universities in the United States according to age, gender, and attendance level. Of 572,186 undergraduate students enrolled during the Fall of 2014 in 341 colleges in the United States 77% were under the age of 25 while 23% were age 25 and older, 40% were male students while 60% were female students, and 66% were full-time students while 34% were part-time students.

Table 7. *Fall 2014 Undergraduate Enrollment by For-Profit 4-year Institution Type, Age, Gender, and Attendance*

Variable	N	Sum	Minimum	Maximum	Mean	Median
Grand total - Age 25 and over	341	442,338	1	128,994	1,297	281
Grand total - Age under 25	338	129,848	1	26,876	384	103
Total men - Age 25 and over	341	181,111	1	41,682	531	128
Total men - Age under 25	338	48,002		7,455	142	46
Total women - Age 25 and over	341	261,227		87,312	766	113
Total women - Age under 25	338	81,846		19,421	242	47
Full time total - Age 25 and over	341	283,031		128,994	830	186
Full time total - Age under 25	338	92,255		26,876	272	77
Full time men - Age 25 and over	341	113,118		41,682	331	92
Full time men - Age under 25	338	33,002		7,455	97	35
Full time women - Age 25 and over	341	169,913		87,312	498	79
Full time women - Age under 25	338	59,253		19,421	175	35
Part time total - Age 25 and over	341	159,307		36,030	467	61
Part time total - Age under 25	338	37,593		7,890	111	18
Part time men - Age 25 and over	341	67,993		23,285	199	27
Part time men - Age under 25	338	15,000		4,519	44	9
Part time women - Age 25 and over	341	91,314		21,907	267	25
Part time women - Age under 25	338	22,593		5,168	66	8

Finally, the findings revealed the following information shown in Table 8 about Fall 2014 undergraduate enrollment demographics of students from public, 4-year universities in the United States according to age, gender, and attendance level. Of 6,010,017 undergraduate students enrolled during the Fall of 2014 in 574 colleges in the United States 80% were under the age of 25 while 20% were age 25 and older, 46% were male students while 54% were female students, and 76% were full-time students while 24% were part-time students.

In summary, of the students enrolled in 1618 colleges in the United States, 72% were under the age of 25 while 28% were age 25 and older; 44% were male students were while 56% female students; 59% were full-time while 41% were part-time; and 9% were only enrolled in distance education courses, 18% were enrolled in some

distance education courses, 73% were not enrolled in any distance education courses; less than 1% were American Indian or Alaska Native students, less than 1% were Asian students, 12% were Black or African American students, 19% were Hispanic students, less than 1% were Native Hawaiian or Other Pacific Islander, 53% were White students, 3% were two or more races, 4 % were listed as race/ethnicity is unknown, and 3% were listed as nonresident alien.

Table 8. *Fall 2014 Undergraduate Enrollment by Public 4-year Institution Type, Age, Gender, and Attendance*

Variable	N	Sum	Minimum	Maximum	Mean	Median
Grand total - Age under 25	574	4,835,538	17	45,628	8,424	5,732
Grand total - Age 25 and over	573	1,174,479	11	22,211	2,049	1,374
Total men - Age under 25	574	2,231,745	6	23,198	3,888	2,389
Total men - Age 25 and over	573	521,031	3	9,724	909	590
Total women - Age under 25	574	2,603,793	11	24,194	4,536	3,227
Total women - Age 25 and over	573	653,448	1	14,129	1,140	759
Full time total - Age under 25	574	4,070,059	14	41,035	7,090	4,622
Full time total - Age 25 and over	573	516,585	11	5,418	901	671
Full time men - Age under 25	574	1,884,473	6	20,808	3,283	2,047
Full time men - Age 25 and over	573	256,580	3	3,422	447	324
Full time women - Age under 25	574	2,185,586	7	20,227	3,807	2,589
Full time women - Age 25 and over	573	260,005	1	3,372	453	336
Part time total - Age under 25	574	765,479		23,096	1,333	774
Part time total - Age 25 and over	573	657,894		17,827	1,148	663
Part time men - Age under 25	574	347,272		10,537	605	350
Part time men - Age 25 and over	573	264,451		9,665	461	258
Part time women - Age under 25	574	418,207		12,559	728	415
Part time women - Age 25 and over	573	393,443		10,757	686	397

Of the 13,568 students enrolled in 37 private, 2-year colleges 65% were under the age of 25 while 34% were age 25 and older, 39% were male students while 61% were female students, and 74% were full-time students while 26% were part-time students. Of the 96,163 students enrolled in 254 for-profit, 2-year colleges 51% were under the age of 25 while 49% were age 25 and older, 36% were male students while 64% were female students, and 90% were full-time students while 10% were part-time students. Of the 5,235,483 students enrolled in 687 public, 2-year colleges in the United States 63% were under the age of 25 while 37% were age 25 and older, 44% were male students while 56% were female students, and 37% were full-time students while 63% were part-time students.

While 1,731,180 students enrolled in 631 private, 4-year colleges. Of those, 79% were under the age of 25 while 21% were age 25 and older, 44% were male students while 56% were female students, and 83% were full-time students while 17% were part-time students. At the same time 572,186 students enrolled in 341 for-profit, 4-year colleges in the Fall of 2014. Of those, 77% were under the age of 25 while 23% were age 25 and older, 40% were male students while 60% were female students, and 66% were full-time students while 34% were part-time students. And 6,010,017 students enrolled in 574 public, 4-year colleges. Of those, 80% were under the age of 25 while 20% were age 25 and older, 46% were male students while 54% were female students, and 76% were full-time students while 24% were part-time students.

Conclusion

Who are the college students of today? The majority of students today tend to be under the age of 25 (72%); female (56%); full-time (59%); not enrolled in any distance education courses (73%); and White (53%). They tend to enroll in public colleges with 5,235,483 students enrolled in 687 2-year colleges and 6,010,017 students enrolled in 574 4-year colleges. While there are more 2-year colleges, the majority of undergraduate students enrolled in 4-year public colleges in the United States during the Fall of 2014. Also, the majority of students enrolled part-time in public, 2-year colleges as opposed to enrolling full-time in private and for-profit 2-year colleges and public, private, and for-profit 4-year or above universities as well full-time in the overall total enrollments in the United States for the Fall semester of 2014.

These female, full-time, under the age of 25, and White students in face-to-face classes in public institutions tend to be stressed, stay in college longer, are not doing what they need to do to learn, are unprepared for college, are connected to family and friends, enjoy some risk in the classroom, and are more diverse. They are technologically proficient and therefore desire classes that are technologically-rich in design. They are skilled in conducting searches on Google and Wikipedia on their various devices while they are not skilled in conducting academic research for their information literacy and other assignments.

Because the major change in the academy in recent years is the students, today's professors need to become knowledgeable about their students. It is critical that professors today also be knowledgeable about technology in order to be able to design and deliver technology-rich classes and incorporate innovative ways to utilize technology to meet the needs and desires of their students. Professors must also understand that students today conduct research on a daily basis on their devices through Internet searches and consider their students' technological preferences and skill-levels when designing technology-rich classes.

What do today's college students want from an education? In consideration that education is not as important to today's college students and that obtaining a college education has become just one more activity for students to juggle, professors need to instill the value of an education. in their students. In order for these students to be successful citizens and future leaders they need to be taught how to think critically and how to evaluate sources on the Web for credibility and reliability. These students need organization and helpful comments concerning how they are doing. They also need help with making career-connected decisions to enhance career development. Professors are encouraged to design learning activities that invite student participation; consider mild stress games to engage students; recognize students' need for connection; ask students questions to offer opportunities for ownership for their own education; and link learning activities to the real world.

Colleges have the duty to society to deliver an education to students that prepares them to lead in the future. It is important to know who these students are and what they desire and require to be able to provide them with an appropriate college education to meet their needs and wants. Furthermore, facilitating and encouraging students to step up and take their own initiatives is essential for student learning and ultimate college success.

Implications

The implications from this research are numerous. To begin with, determining who these students are and what they desire and require from colleges is critical for higher education. Colleges have the duty to the society it serves to make education available so that today's students are in the best position to become tomorrow's leaders. It is important to know who these students are and what they desire and require from higher education in order to be able to provide them with an appropriate college education to meet their needs and wants. Furthermore, facilitating and encouraging students to step up and take their own initiative for their education is essential for student learning and ultimate college success. Identifying who these students are is the first step in addressing how to teach these students successfully. Also, there are a number of college students who never graduate. Colleges must follow these students to determine what happens to these lost students. Higher education must examine the demographics of its college students to avoid potential loss of valuable student resources. Another implication, there are a number of potential students who never enroll in college courses. Consequently, college administrators must communicate with these individuals to determine if colleges are providing sufficient outreach.

Limitations and Delimitations

At the onset of this study, specific limitations and delimitations were recognized. In view of the completed study, discussion of these limitations is needed. The quantitative data for this study were obtained from the 2014 academic years of institutions that reported to IPEDS. An examination of previous or subsequent years may have yielded different results. Additionally, data were only gathered from institutions that report to IPEDS. Although the IPEDS Data Center provided large sample sizes in all sectors of institutions, the inclusion of institutions that do not report to IPEDS may have altered the results of this study. In addition, as with all self-reported data, it is possible that data were reported to IPEDS incorrectly. If this were the case, the information would yield inaccurate results.

Recommendations

It is recommended that this study be replicated to validate these findings. Further research could be conducted examining why these demographics exist in the first place. Moreover, why are there more women enrolling in colleges today? Why are minority groups underrepresented in college enrollments? It is also recommended that studies be conducted to determine if the enrollment numbers for the Fall of 2014 was impacted by other factors than student demographics. In addition, studies could be conducted to ascertain if similar numbers exist in other countries regarding college students today. It is further recommended that ongoing studies be conducted to monitor college students in the United States.

References

Brunner, J. L., Wallace, D. L., Reymann, L. S., Sellers, J., & McCabe, A. G. (2014). College counseling today: Contemporary students and how counseling centers meet their needs. *Journal of College Student Psychotherapy*, *28*(4), 257-324. doi:10.1080/87568225.2014.948770

Chen, X., & Yur-Austin, J. (2016). College challenge to ensure "timely graduation": Understanding college students' mindsets during the financial crisis. *Journal of Education for Business, 91*(1), 32-37. doi:10.1080/08832323.2015.1110106

Crone, I., & MacKay, K. (2007). Motivating today's college students. *Peer Review*, *9*(1), 18-21.

Flanagan, C. (2015). That's not funny! Today's college students can't seem to take a joke. *The Atlantic*, (2). 54.

Halawah, I. (2011). Factors influencing college students' motivation to learn from students' perspective. *Education*, *132*(2), 379-390.

Harden, N. (2013). Peter Pan goes to college. *Society*, *50*(3), 257. doi:10.1007/s12115-013-9665-x

Head, A. J., & Eisenberg, M. B. (2009). Finding context: What today's college students say about conducting research in the digital age. (Project Information Literacy Progress Report, The Information School, University of Washington). *Project Information Literacy*.

Jennings, E. (2008). Using Wikipedia to teach information literacy. *College & Undergraduate Libraries*, *15*(4), 432. doi:10.1080/10691310802554895

Larkin, J. A. (2007). Job choice and career relevance for today's college students. *Journal of Employment Counseling*, *44*(2), 86-94.

Lawrence, K. (2015). Today's college students: Skimmers, scanners and efficiency-seekers. *Information Services & Use*, *35*(1/2), 89-93. doi:10.3233/ISU-150765

Levine, A., & Cureton, J. S. (1998). What we know about today's college students. *About Campus*, *3*(1), 4-9.

Kline, A. D. (2015). Students are smarter, but have they changed? *B>Quest*, 1-8.

McCormack, S. K. (2015). Teaching history online to today's community college students. *Journal of American History*, *101*(4), 1215-1221. doi:10.1093/jahist/jav100

McCoy, C. (2010). Perceived self-efficacy and technology proficiency in undergraduate college students. *Computers& Education*, *55*1614-1617. doi:10.1016/j.compedu.2010.07.003

Ratliff, A. F. (2011). Are they listening? Social media on campuses of higher education. *Journal of The Australian & New Zealand Student Services Association*, (38), 65.

Robinson, S., & Stubberud, H. A. (2012a). Student choice of course materials. *Allied Academies International Conference: Proceedings of The Academy of Educational Leadership (AEL), 17*(1), 41.

Robinson, S., & Stubberud, H. A. (2012b). Student preferences for educational materials: Old meets new. *Academy of Educational Leadership Journal*, *16*99-109.

Robinson, S. (2013). Student response to risk in classroom learning games. *Academy of Educational Leadership Journal*, *17*(4), 1-12.

Russo, T. J., Fallon, M. A., Zhang, J., & Acevedo, V. C. (2014). Today's university students and their need to connect. *Brock Education: A Journal of Educational Research and Practice*, *23*(2), 84-96.

Speaker, K. (2004). Student perspectives: Expectations of multimedia technology in a college literature class. *Reading Improvement*, *41*(4), 241.

The Higher Education Act. 20 U.S. C. §1001. (1965)

U.S. Department of Education, National Center for Education Statistics. (2015). *The Condition of Education 2015* (NCES 2015-144), Institutional Retention and Graduation Rates for Undergraduate Students.

Watkins, D. C., Hunt, J. B., & Eisenberg, D. (2012). Increased demand for mental health services on college campuses: Perspectives from administrators. *Qualitative Social Work*, *11*(3), 319-337. doi:10.1177/1473325011401468