

CHAPTER IV

EVALUATION OF THE AWARENESS FACTOR EFFECT ON E-SERVICES

ADOPTION IN HIGHER EDUCATION IN LIBYAN UNIVERSITIES

4.1 Introduction

The pilot study research was presented in the earlier chapters and the purpose of this chapter is to state the results achieved from the findings. A survey was conducted upon the adoption and usage by the Libyan universities students of the e-services. The factors which affect the e-services adoption and the implementation efficiency of the services in higher education of Libya would be stated in the following sub-sections. E-services adoption in the Libyan higher education is affected by the awareness of the users of these e-services and to understand this aspect, a survey is conducted whose results are also stated as part of this section. The awareness of the students regarding the e-services adoption would be stated in order to understand all aspects.

4.2 Methodology

The reliability and validity of the survey questions can be tested through a pilot study (Haddock et al., (1998); and van Teijlingen & Hundley, 2001). Three of the largest universities of Libya were taken into account for data collection. They are:

- 1-Tripoli university in Tripoli, west of Libya (the capital city)
- 2-Benghazi university (Benghazi city) middle of Libya
- 3-Omar AL-Mukhtar University (AL-Beda city) east of Libya.

The population size of each university determined the sample size which would be taken into account for the survey.

- 1-Tripoli university - population of 50000 with sample of 381 students .
- 2-Benghazi university - population of 35000 with sample of 379 students.
- 3- Omar AL-Mukhtar university - population above 26000 with sample of 377 students.

Random sample which includes both genders was included along with different specializations and education levels. A paper survey was carried out where the questionnaire was distributed in all three universities. The time period of this survey lasted from December to March. The SPSS software was used to analyze the data and the following statistical methods were applied to achieve reliable results:

1-Frequency Distribution – Independent variables like education, specialization, age, gender, computer and internet experience were subjected to frequency distribution for grouped data.

2-Reliability tests – Reliability in mathematical terms is the proportion of the variability to the responses to the survey (Chapter 4 presents the reliability equation). The Cronbach's coefficient alpha values was applied to measure the reliability of the data. This test was conducted to achieve consistent and valuable results (Hinton *et al.*, 2004; Field, 2005).

3-Basic Chi Square (χ) – The awareness of students and availability are the two main factors for the research study. Hence, possible relationships between these variables have been analyzed with the help of the Chi Square (χ) test.

4-Correlation Methods – Correlation test helped analyze and highlight the relationship between different variables

5-Analysis of Variance (ANOVA) – By measuring the significant difference, the mean difference of the answers provided by the students was observed with the help of ANOVA.

6-Regression Analysis – The dependent variable used for the regression analysis was the adoption of e-services of higher education in Libya and the predictor variables were the issue of privacy, risk predictions, availability of e-services, trust in ministry of higher education, awareness of e-services of higher education, Intention and motivation to use e-services and familiarity with the computer and internet.

4.3 Results

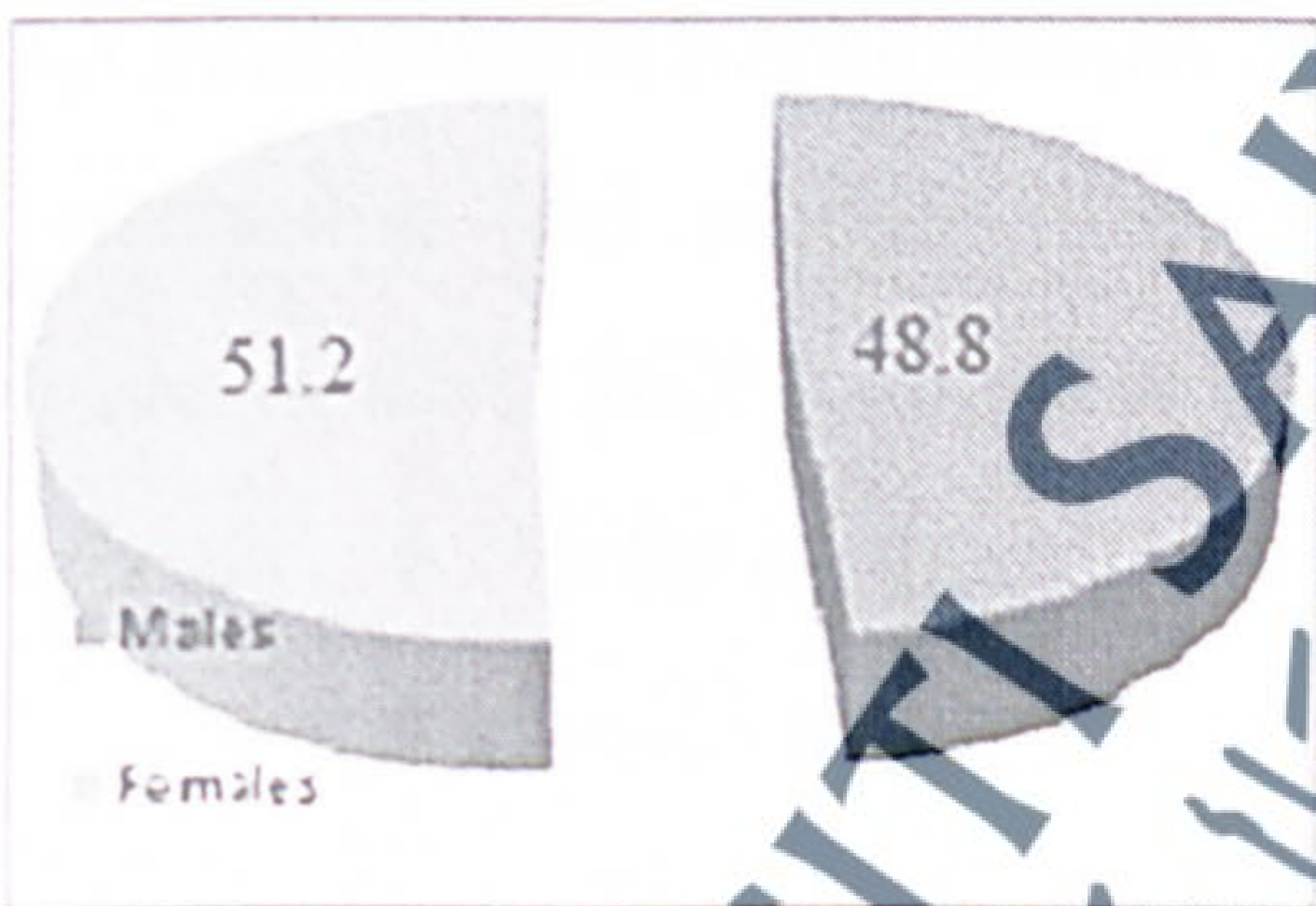
4.3.1 Respondents’ profile of Tripoli university

At the Tripoli University, 400 Libyan students were given the questionnaire to be filled on the 1st of December 2013 and this questionnaire was collected by the end of March 2014. 390 questionnaires were collected in total out of the 400. 9 of the respondents failed to respond to the questions appropriately which is why they were discarded (because the respondents didn't answer some questions and some of them gave two answers to one question) and the remaining 381 were used for analysis.

4.3.1.1 Gender of respondents

The e-services studies conducted in Libya showed that out of the total respondents 94.7% of them were males and only 5.3% were females. However, in this study, within the Tripoli University respondents, out of the total participants 48.8% were males and 51.2% were females (Table 13, Figure 8).

TABLE 13: Gender of Respondents



Gender	Frequency	Percent
Male	186	48.8
Female	195	51.2
Total	381	100.0

FIGURE 8: Gender of Respondents

4.3.1.2 Age of participants

When considering the age of the Tripoli University respondents, 19-29 years age group was covered by 51.7% of the participants, 30-40 years age group were 46.5% respondents and only 1.8% were above the age of 40 years (Table 14, Figure 9). Keeping online respondents in mind, 47.7% were between 26 to 35 years of age (Nassraddeen (2010). Hence, it is observed that mostly middle aged individuals of Libya make use of the internet. This age disparity clearly shows that the internet or

computer users are being educated at the educational institutions, high schools or universities.

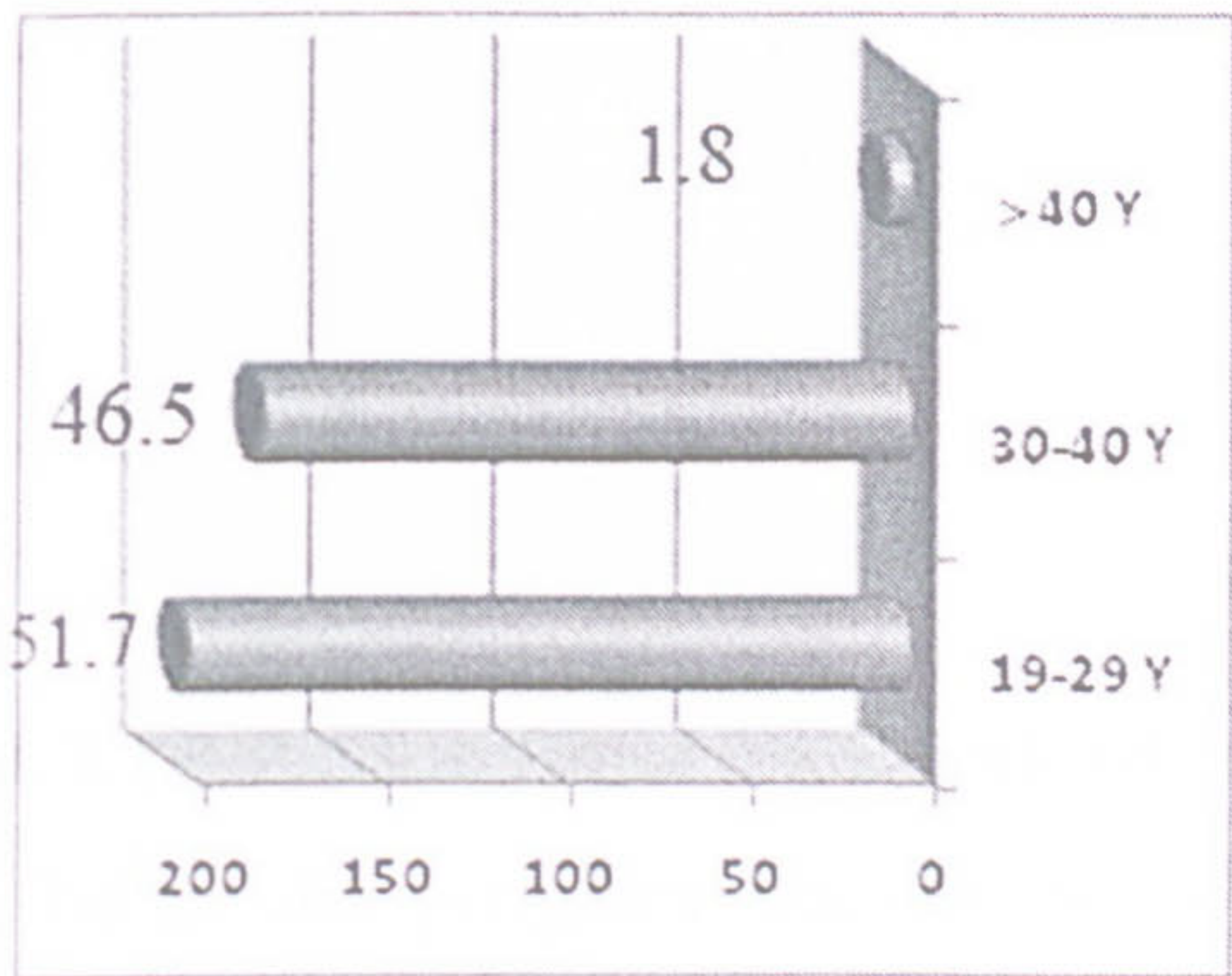


FIGURE 9: Age of Respondents

TABLE 14: Age of Respondents

The Age Groups	Frequency	Percent
19-29 Years	197	51.7
30-40 ears	177	46.5
>40 Years	7	1.8
Total	381	100.0

4.3.1.3 Professional backgrounds of the participants

The economic and mathematics professional background consisted of the most respondents with 26.2%, followed by 24.9% for literary, 24.7% for medicine and biology and 24.1% for computer and engineering (Table 15, Figure10).

TABLE 15: Professional Background of Students

professional background	Frequency	Percent
Computer and engineering	92	24.1
Economic and mathematics	100	26.2
Medical and biology	94	24.7
Literary	95	24.9
Total	381	100.0

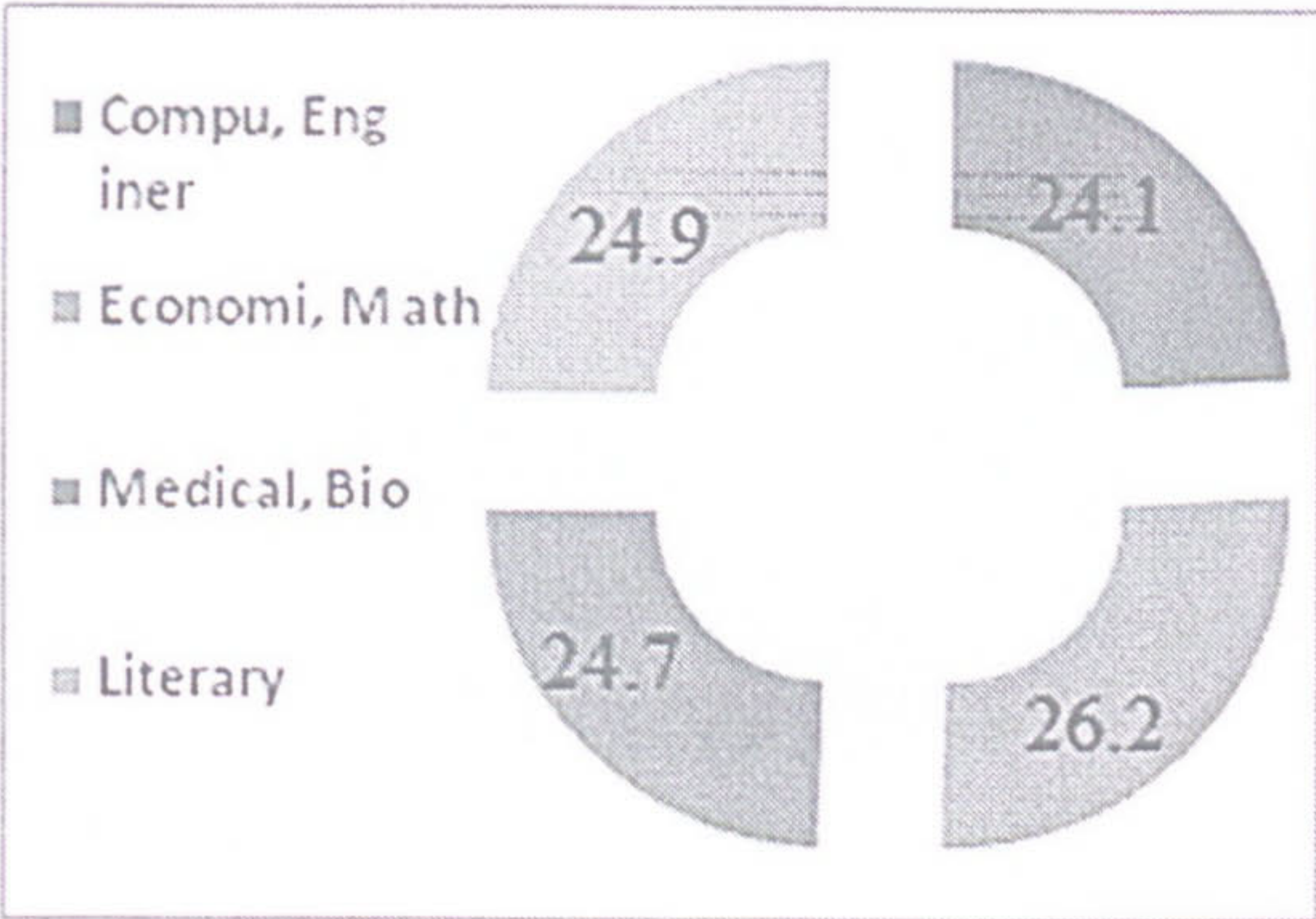


FIGURE 10: Professional Backgrounds of Students

4.3.1.4 Educational backgrounds of participants

The master program students were highest in percentage at 33.60% followed by the PH.D students with 31.76%, 18.37% for bachelor, 13.12% for high diploma and 3.15% for post doctorate (Table 16, Figure 11). Nassradeen (2010) conducted an online survey study where it was found that 43% of the respondents have received a bachelor degree, 22.5% are still in high school and 23.7% have received the postgraduate education. 0.5% of the respondents were expected to have no formal education.

TABLE 16: Educational Background of Respondents

Education	Frequency	Percent
post DR	12	3.15
Doctorate	121	31.76
Master	128	33.60
Bachelor	70	18.37
high diploma	50	13.12
Total	381	100.0

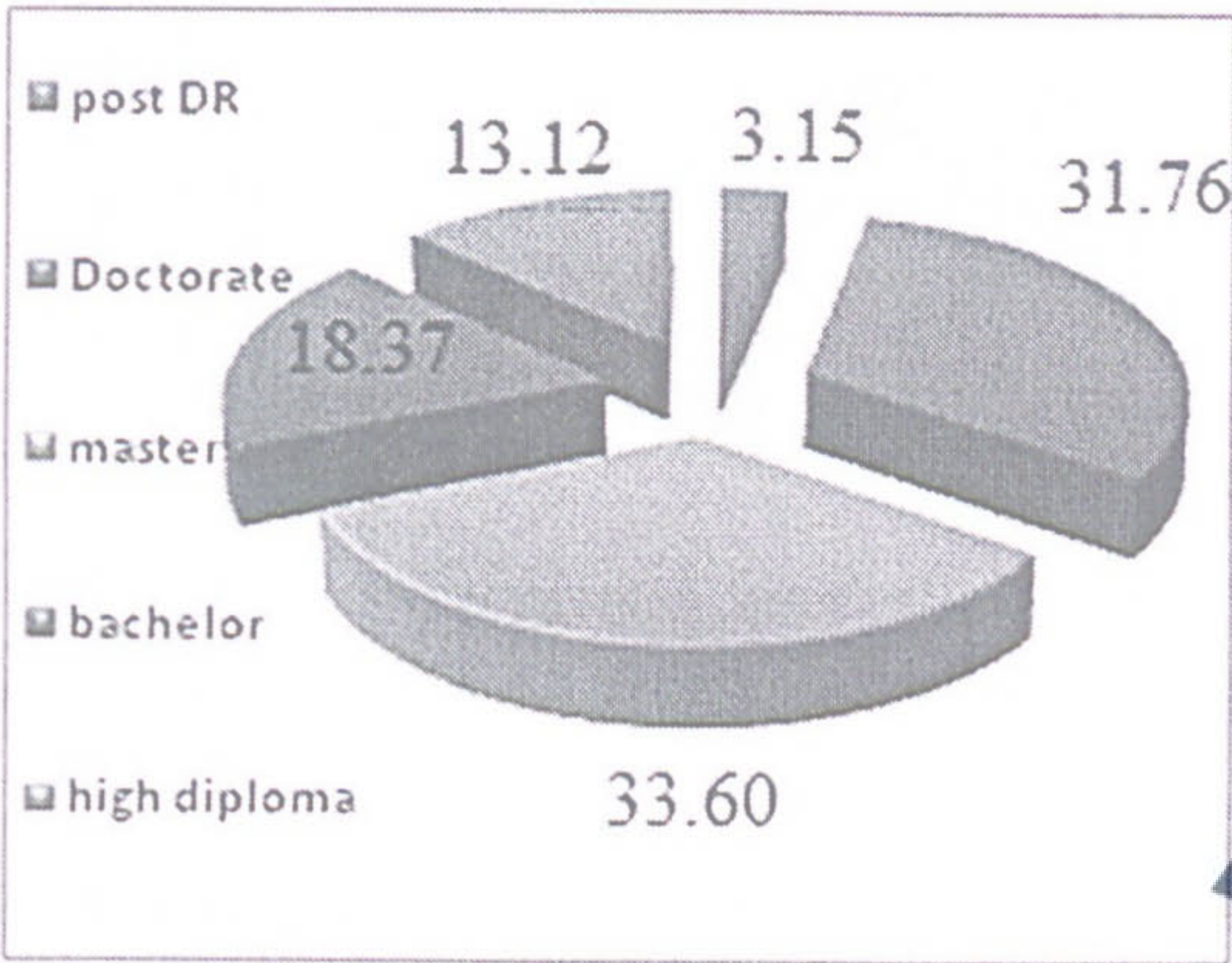


FIGURE 11: Educational Background of Students

4.3.1.5 Students internet experience

The survey shows that nearly 69.6% of the students have been making use of the Internet for a period of more than 4 years. 26.2% students have been using since 3 to 4 years and 4.2% from 1-2 years (Table 17, Figure 12). The survey results have then been compared to the results brought forward by Nassraddeen (2010). His results state that 46.0% of the respondent used the internet for 2 to 5 years, 29.3% for more than 6 years and about 10.1% of the participant for more than 10 years. The respondents of the 10 years use were mostly the case for the individuals studying abroad. Out of the respondent, only 14% had starting using the internet for less than 2 years. Hence, the results show that the Internet has been available for use for professional like medical doctors, engineers or lecturers of Libya since many years. If the Libyan individuals were being educated abroad, then they had a much earlier exposure of the computer or internet. Thus, the results are consistent with the literature review presented above. It is believed that the creation and improvement of awareness and participation of the e-services implementation in Libya is positively influenced by education.

TABLE 17: Students Internet Experience

Students Internet Experience	Frequency	Percent
1-2 years	16	4.2
3-4 years	100	26.2
>4 years	265	69.6
Total	381	100.0

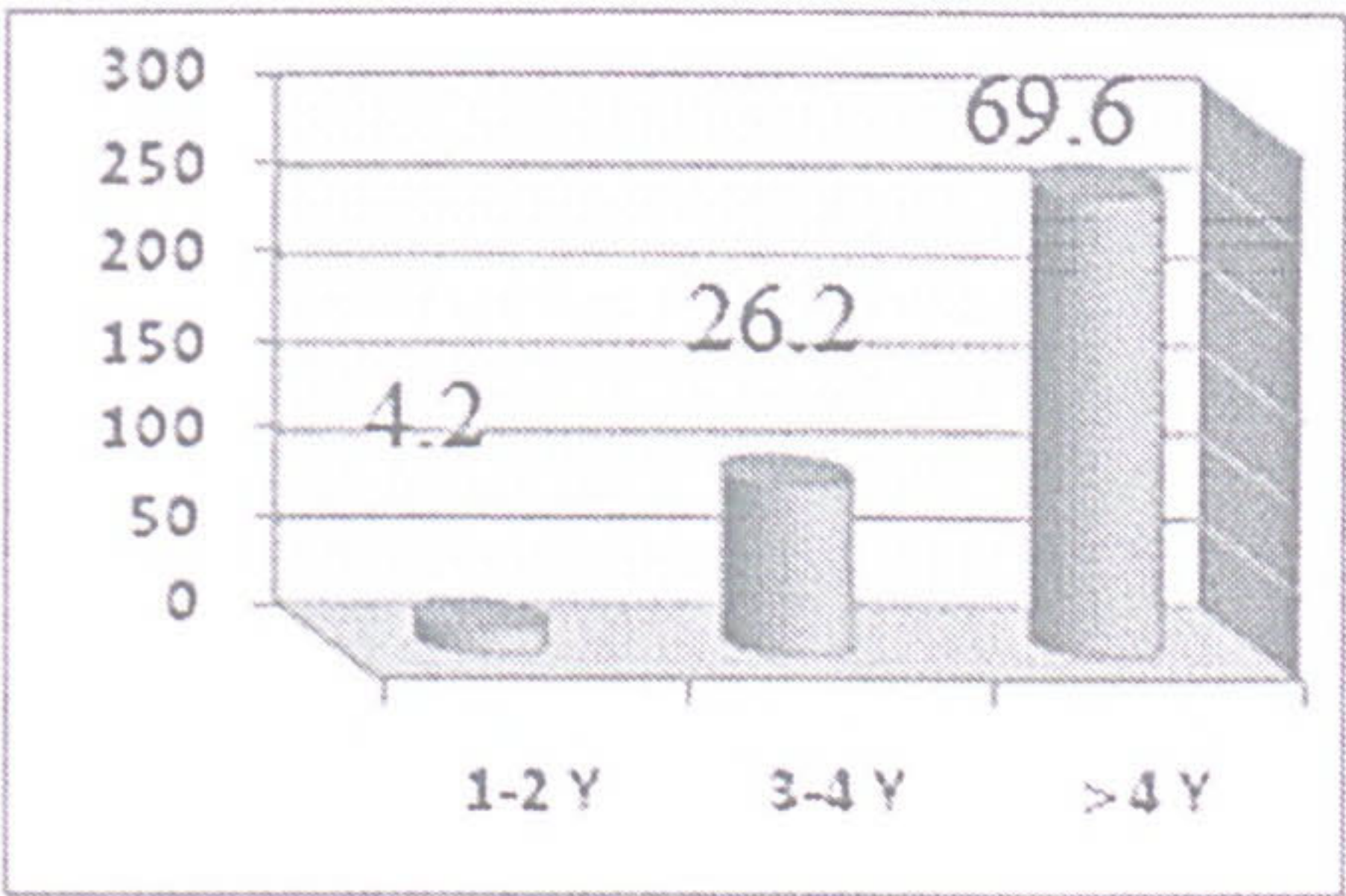


FIGURE 12: Students Internet Experience

4.3.1. 6 Computer experience of students

49.1% of the total students were making use of the Internet for over 5 years which is why it is found that most of the students had background experience. 3 to 5 years of experience was present in 45.4% of the participants and less than 3 years of computer operating knowledge was present in 5.5% of the respondents (Table 18, Figure 13). The studies present in literature state that working knowledge of computer was present in 28.5% of the total participants and 28.0% showed that they had more than the normal knowledge. Advanced computer skills were present in 34.3% of respondents and beginners or basic computing abilities were present in 8.8%. Hence, nearly 81% of the respondents have the typical computer skills required.

TABLE 18: Students Computer Experience

Students Computer Experience	Frequency	Percent
< 3 years	21	5.5
3-5 years	173	45.4
>5 years	187	49.1
Total	381	100.0

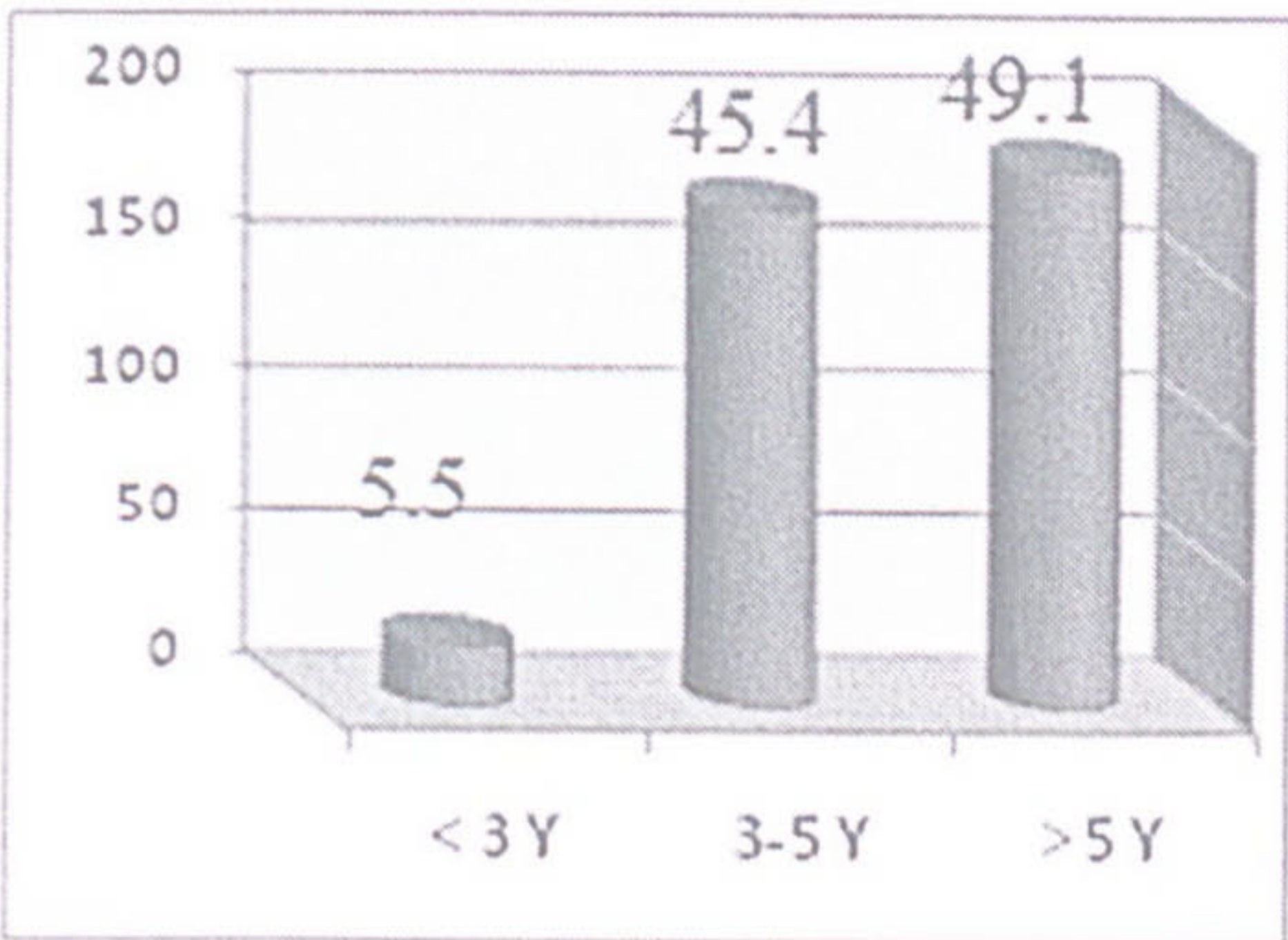


FIGURE 13 Students Computer Experience

4.3.1.7 Participants' internet usage

Daily users of the Internet were the largest with 58% of the total respondents followed by the weekly users which were 39.4% and the monthly users were smallest with 2.6% (Table 19, Figure 14). The residents of Libya are subjected to difficulty in access to the Internet at home, universities, workplaces or schools but they are still highly interested in using the technology for all purposes. Hence, through infrastructure development, awareness of e- services, training and opportunities, it would be possible to increase the use of Internet within the residents (Abdulrazzaq et al., 2003). When respondents gained access to the Internet, it was found that nearly 84.7% of them were using it for less than 5 hours (Abdalmohsen & Mayhew, 2005).

TABLE 19: Respondents 'Internet Usage

Respondents 'Internet Usage	Frequency	Percent
Daily	221	58.0
Weekly	150	39.4
Monthly	10	2.6
Annually	0	0
Total	381	100.0

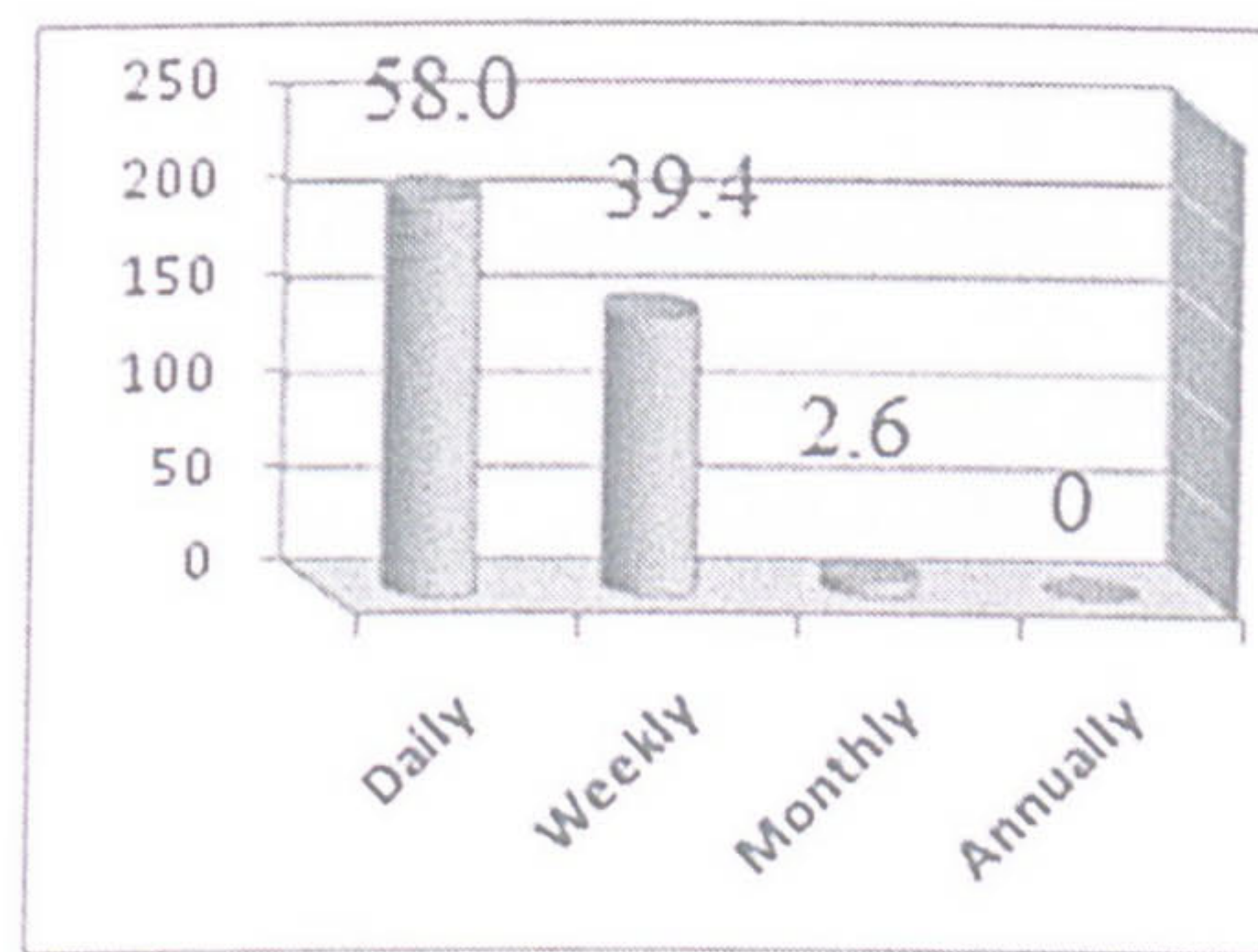


FIGURE 14: Students Internet usage

4.3.2 Adoption of e-services in higher education in Tripoli university depend on awareness level

The majority of risks involved in e-services include lack of human awareness (knowledge and skills) necessary to plan, manage, and operate e-services West, Abdulrazzaq et al., (2003). Previous study by Nassraddeen, (2010) was aims to improve the general awareness of e- services by providing a set of guidelines that would help the Libyan' government' transition to an e- services environment by overcoming common challenges and problems. This chapter aims to evaluate awareness as critical factor affecting successfully implementation of e-services in higher education in Libyan universities.

4.3.2.1 Reliability test

The internal consistency of the data along with the reliability of the questionnaire information was tested by using Cronbach's coefficient alpha values (Hinton et al., 2004; Field, 2005). According to this theory, the higher Cronbach's (a) value of construct scores, the higher the reliability of the same construct measurements [23]. Four different points of reliability have been brought forward by Hinton et al (2004). They are:

- 1-Excellent reliability - 0.90 and above
- 2-High reliability - 0.70 - 0.90
- 3-Moderate reliability - 0.50 - 0.70
- 4-Low reliability - 0.50 and below (Hinton et al., 2004).

For the purpose of this study, the Cronbach’s alpha was 0.894 which falls in the category of excellent reliability. The e-services are observed to be highly reliable along with the adoption of e-services and intention and motivation was 0.910 (Table 20).

TABLE 20: Reliability of Measurements

Study factors	Cronbach's Alpha (a)	Type	Standards of Reliability
Awareness of e- services	0.894	High reliability	0.70-0.90
Intention and motivation	0.910	Excellent reliability	≥ 0.90
Adoption of e-services	0.948	Excellent reliability	≥ 0.90

4.3.2.2 Binary correlation test

The relationship between e-services adoption and any demographic characters or related factors or awareness was tested by using the Binary Correlation Test. Related factors include the awareness of e-services of higher education and intention and motivation to use or the familiarity with the computer and internet. With the help of this test it was found that a strong positive relationship exists between the education level or age and e-services adoption. However, e-services and specialization or gender do not have a significant correlation (Table 21). The study factors show that there is a significant positive correlation present between motivation to use, familiarity with the computer and internet, awareness of e-services of higher education and the adoption of e-services (Table 22).

TABLE 21: Correlations between demographic characters and e-services adoption in Tripoli university

Character	Adoption of e-services	Significant of correlation
Sex	.073	No correlation
	.222	No significant
	381	N
Age	.235**	High correlation
	.001	High significant
	381	N
Specialization	.042	No correlation
	.415	No significant
	381	N
Education	.341**	High correlation
	.001	High significant
	381	N

** Correlation is significant at the 0.001 level (2-tailed).

TABLE 22: Correlation between Awareness and Related Factors and E-services Adoption

Factor	Adoption of e-services	Significant of correlation
Familiarity with the computer and internet	.892**	High correlation
	.001	High significant
	381	N
Awareness of e-services of higher education	.944**	High correlation
	.001	High significant
	381	N
Intention and motivation to use	.862**	High correlation
	.001	High significant
	381	N

** Correlation is significant at the 0.001 (2-tailed).

4.3.2.3 Regression analysis with all study factors

A regression analysis was carried out as part of this report in which the independent variables were the study factors and the dependent variable was the e-services adoption. 381 cases were taken into account out of which a significant model was extracted. This model is ($F(6, 381) = 204.490, p < 0.000$) (Appendix A Table 5). with the R square being .933 (Appendix A Table 4). In Table 6 Appendix A the significant variables are presented which include the trust in ministry of higher education, technology and in e-services ($=.984, p < .000$), familiarity with the computer and internet ($= .881, p < .000$), Intention and motivation to use ($=.994, p < .000$), awareness of e-services of higher education ($= .972, p < .000$), the availability of e-services ($=.989, p < .000$) on e-services adoption. Risk prediction and privacy issue ($= .022, p = .595$) were two variables which were not considered as significant as part of this model. The proportion of variation in the response variable which is presented by the regression model has been represented by the measure *R Square*, mostly stated as R^2 is the square of R. It consists of values which lie between (0) and (1). A good fit for model being tested is present if the R^2 value is high. In the present study, the R^2 states the 93.3% changes present in the adoption of e-services. The remaining 6.7% are the unidentifiable factors.

The e-services adoption was stated as the dependent variable and the intention and motivation to use, awareness of e-services of higher education and familiarity with the computer and internet were kept as separate factors for the regression analysis to be performed.

4.3.2.4 Regression analysis with awareness and other related factors

It is the size of (β) which states that the significant variable, intention and motivation to use, has the strongest impact upon the explanation of variation of e-services adoption followed by awareness of e-services of higher education and familiarity with the computer and internet. This is presented in the table 25 below and it is also found that Table 23 consists of a significant model emerged ($F(3, 381) = 209.067, p < 0.000$) (Table 24) with the R square being .893 (Table 23).

TABLE 23: Regression Analysis: Model Summary

Model	R	R Square	Adjusted R Square	Significant of correlation
1	.945**	.893	.892	High correlation

** Correlation is significant at the 0.001 level (2-tailed).

TABLE 24: Regression: Analysis ANOVA

Model	Sum of Squares	Mean Square	F	Sig.	Regression ANOVA:
Regression	9.329	3.861	209.067	.000	High significant
Residual	6.897	.017			
Total	16.22				

High significant P< 0.000

TABLE 25: Regression Analysis: Coefficients

Factor	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	Significant of regression
	B	Beta			
Familiarity	.794	.863	6.22	.000	High significant
Awareness	.834	.904	5.80	.000	
Intention	.976	.964	8.33	.000	

High significant P< 0.000

4.3.2.5 Analysis of variance (ANOVA)

The significant differences between the answers provided by the students were measured by detecting their mean differences using the ANOVA tests. For each factor, intention and motivation to use and adoption of e-services, the analysis of variance, significant differences ((F (7, 381) = 712.534, p < 0.000)) between means of answer question was found as presented in (Table26). With the help of these differences it is found that the independent factor, awareness effect, has upon the dependent factors which are intention and motivation to use and adoption of e-services. The mean answer of the respondents and the differences has been stated in Table7 Appendix A .

TABLE 26: Analysis of Variance

Factor	Differences	Sum of Squares	Mean Square	F	Sig.	Regression ANOVA:	
Adoption	Between Groups	1.040	.149	712.5	.000	High significant	
	Within Groups	.078	.000				
	Total	1.118					
Intention	Between Groups	10.272	1.467	132.2	.000		
	Within Groups	4.138	.011				
	Total	14.409					

High significant P< 0.000

4.3.3 Respondents’ profile of Benghazi university

In the first week of December 2013, 400 Libyan students of Benghazi University were given a questionnaire which was to be collected by the end of March 2014. 385 responses were received out of the total distributed and out of these 6 were discarded as the answers were either incomplete or vague. Hence, the analysis was carried out upon 379 responses.

4.3.3.1 Gender of respondents

49.08% males and 50.92% female respondents were part of the 379 respondents (Table27 and Figure 15).

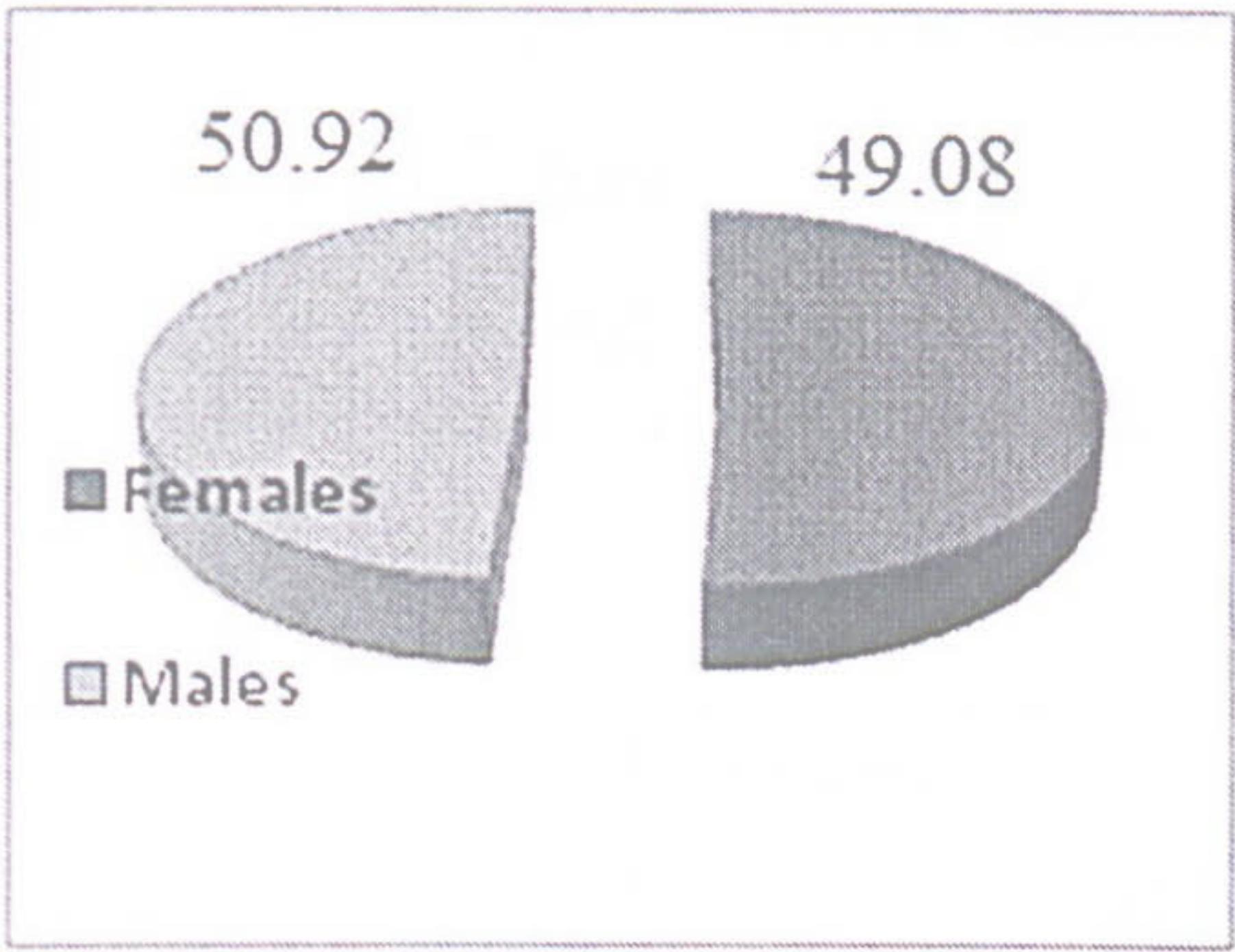


FIGURE 15: Gender of Respondents

TABLE 27: Gender of Respondents

Gender	Frequency	Percent
Male	186	49.08
Female	193	50.92
Total	379	100.0

4.3.3.2 Age of participants

The Benghazi university respondent age was of the following category. 52.51% were between 19to 29 years, 44.33% were between 30 to 40yearsand 3.17 % were above 40 years (Table 28, Figure 16).

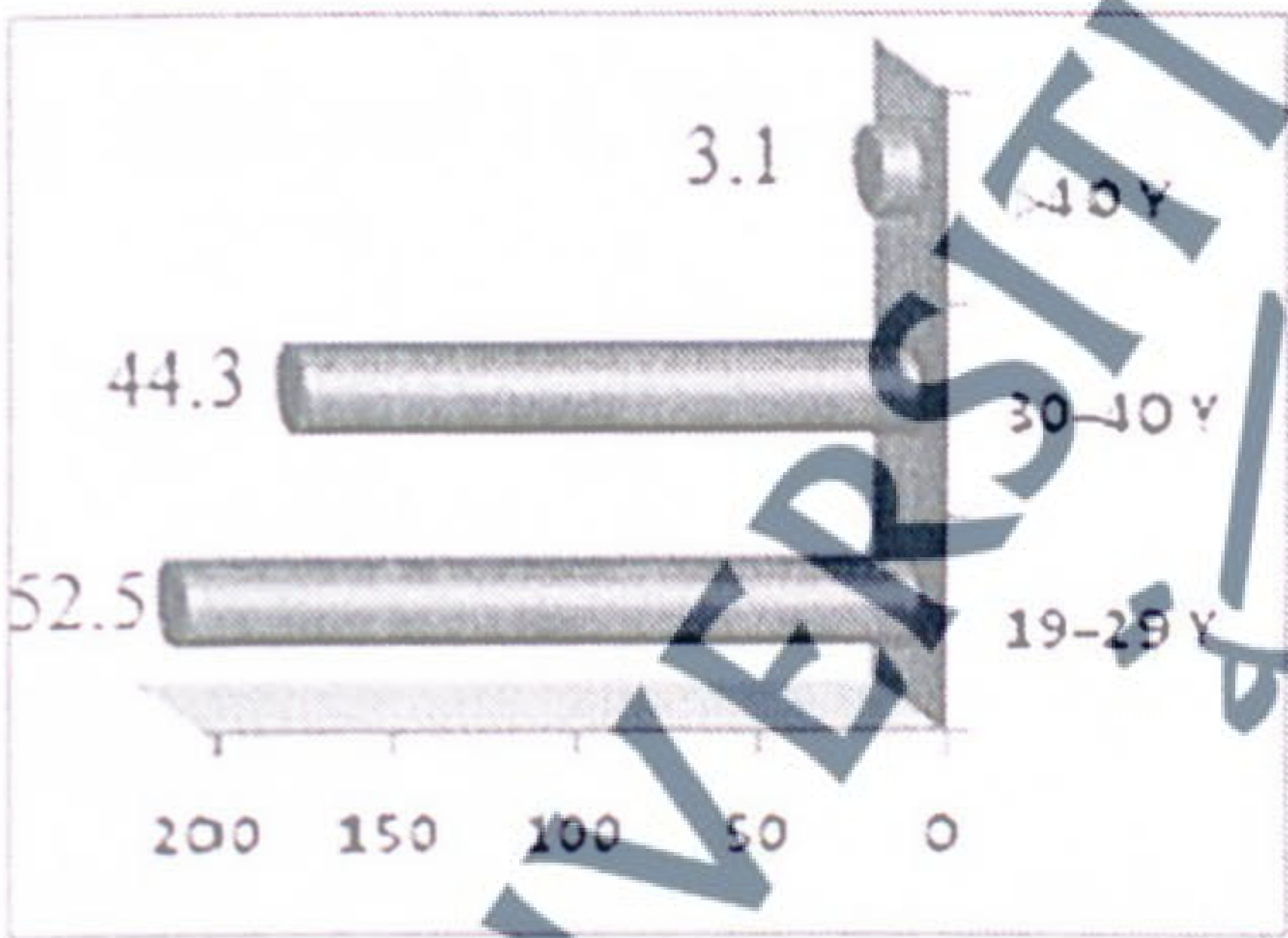


FIGURE16: Age of Respondents

TABLE 28: Age of Respondents

The Age Groups	Frequency	Percent
19-29 Years	199	52.51
30-41 ears	168	44.33
>40 Years	12	3.17
Total	379	100.0

4.3.3.3 Professional backgrounds of participants

When considering the specialization of the respondents, 25.86% specialized in economic and mathematics, 25.06% in literary, 24.80% in medical and biology and 24.27% computer and engineering (Table 29, Figure 17).

TABLE 29: Professional Background of Students

professional background	Frequency	Percent
Computer and engineering	92	24.27
Economic and mathematics	98	25.86
Medical and biology	94	24.80
Literary	95	25.06
Total	379	100.0

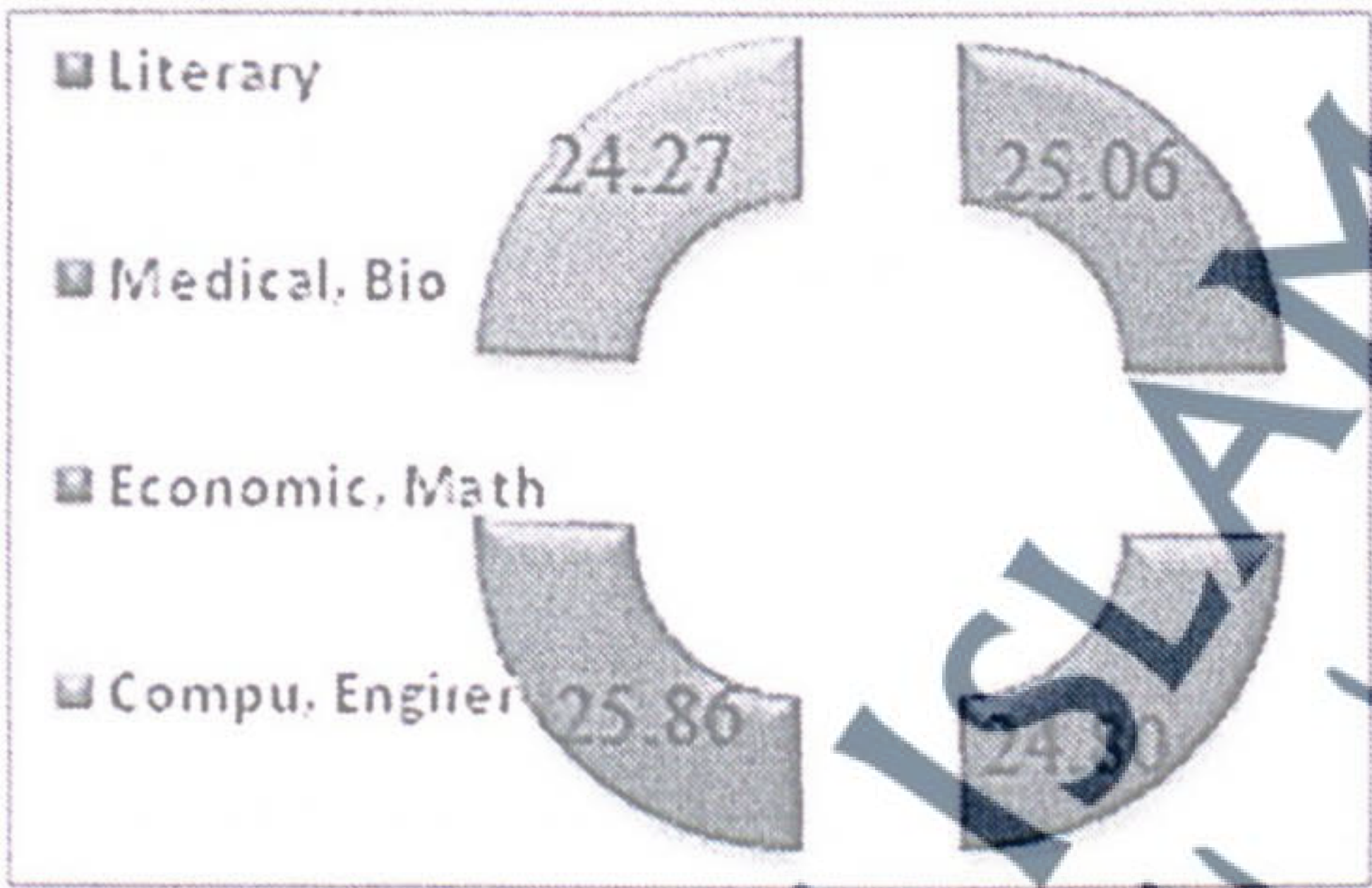


FIGURE 17: Professional Background of Students

4.3.3.4 Educational backgrounds of participants

The master students had the largest percentage 32.45% followed by the doctorate students who had a percentage of 31.13%. The bachelor students were 19.26%, high diploma was 14.78% and post doctorate was 2.37% (Table 30, Figure 18).

TABLE 30: Educational Background of Respondents

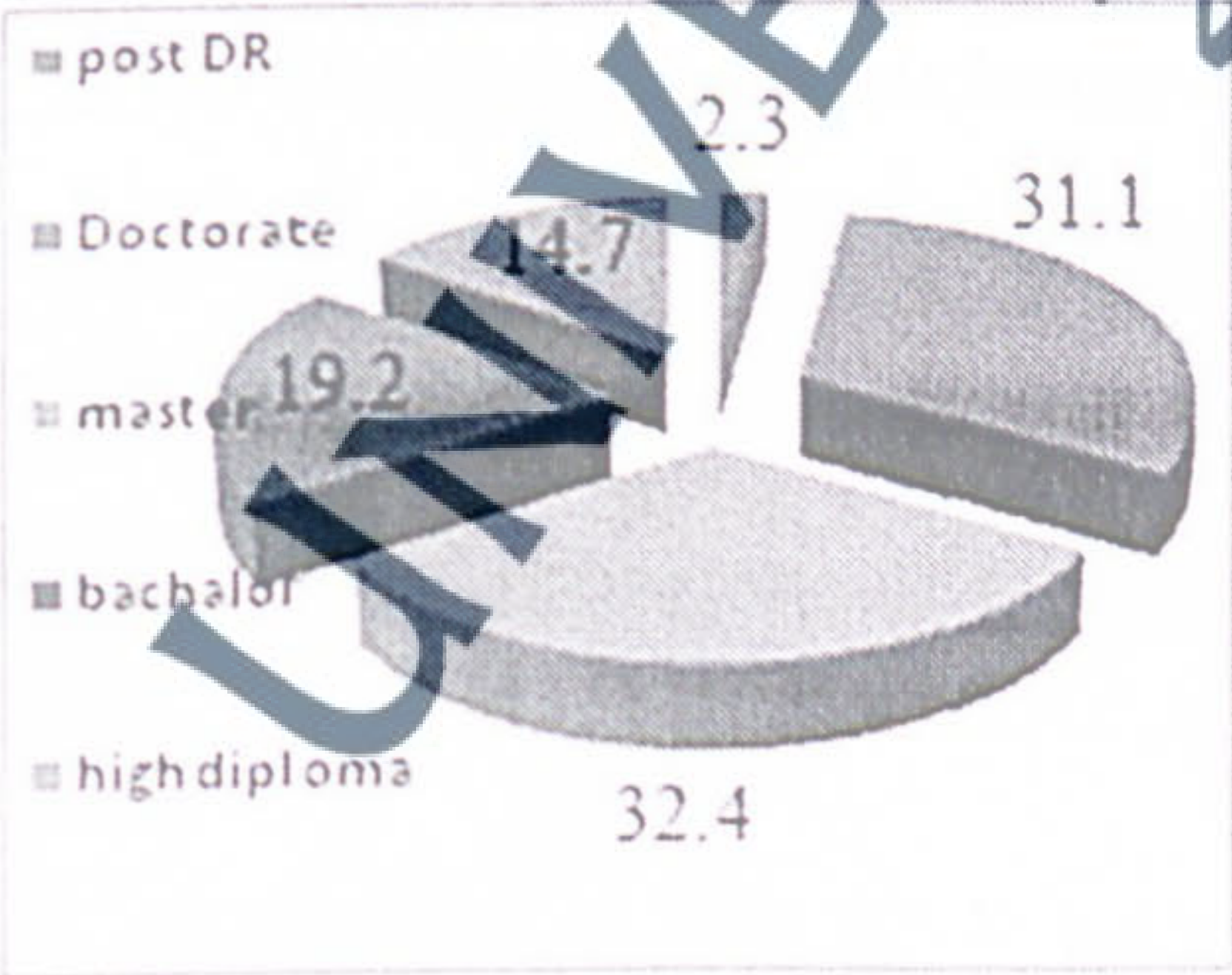


FIGURE 18: Educational Background of respondent

Education	Frequency	Percent
post DR	9	2.37
Doctorate	118	31.13
master	123	32.45
bachelor	73	19.26
high diploma	56	14.78
Total	379	100.0

4.3.3.5 Students internet experience

The internet experience of the students showed that 69.9% have made use of it for over 4 years, 26.4% for 3-4 years and 3.7% for 1 -2 years (Table 31, Figure 19).

TABLE 31: Students Internet Experience

Students Internet Experience	Frequency	Percent
1-2 years	14	3.7
3-4 years	100	26.4
>4 years	265	69.9
Total	379	100.0

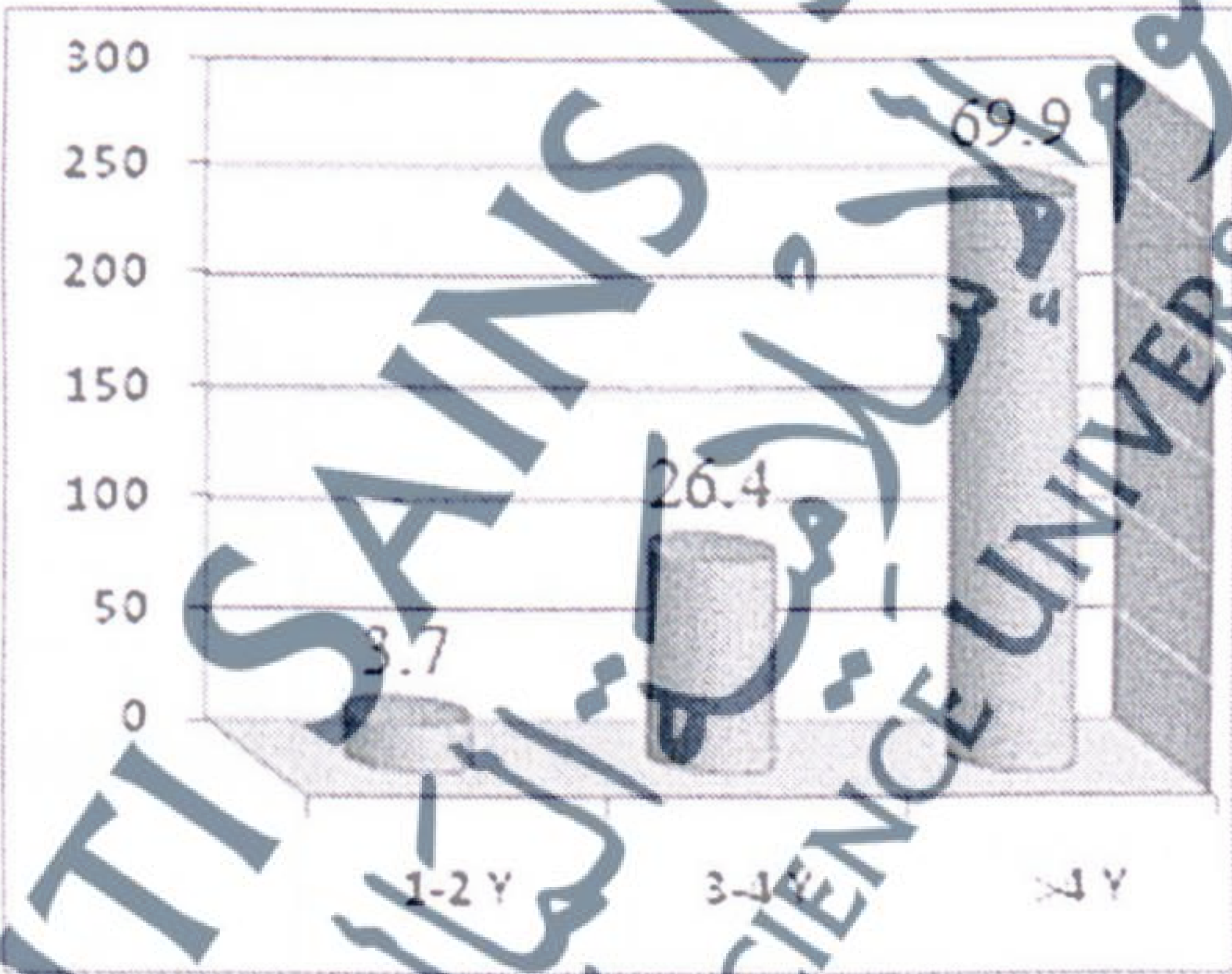


FIGURE 19: Students Internet Experience

4.3.3.6 Computer experience of students

The computer experience of the students showed that 49.3% had experience for over 4 years, 45.6% had the experience for 3 to 4 years and 5.0 % of the respondents had less than 3 years experience (Table 32, Figure 20).

TABLE 32: Students Computer Experience

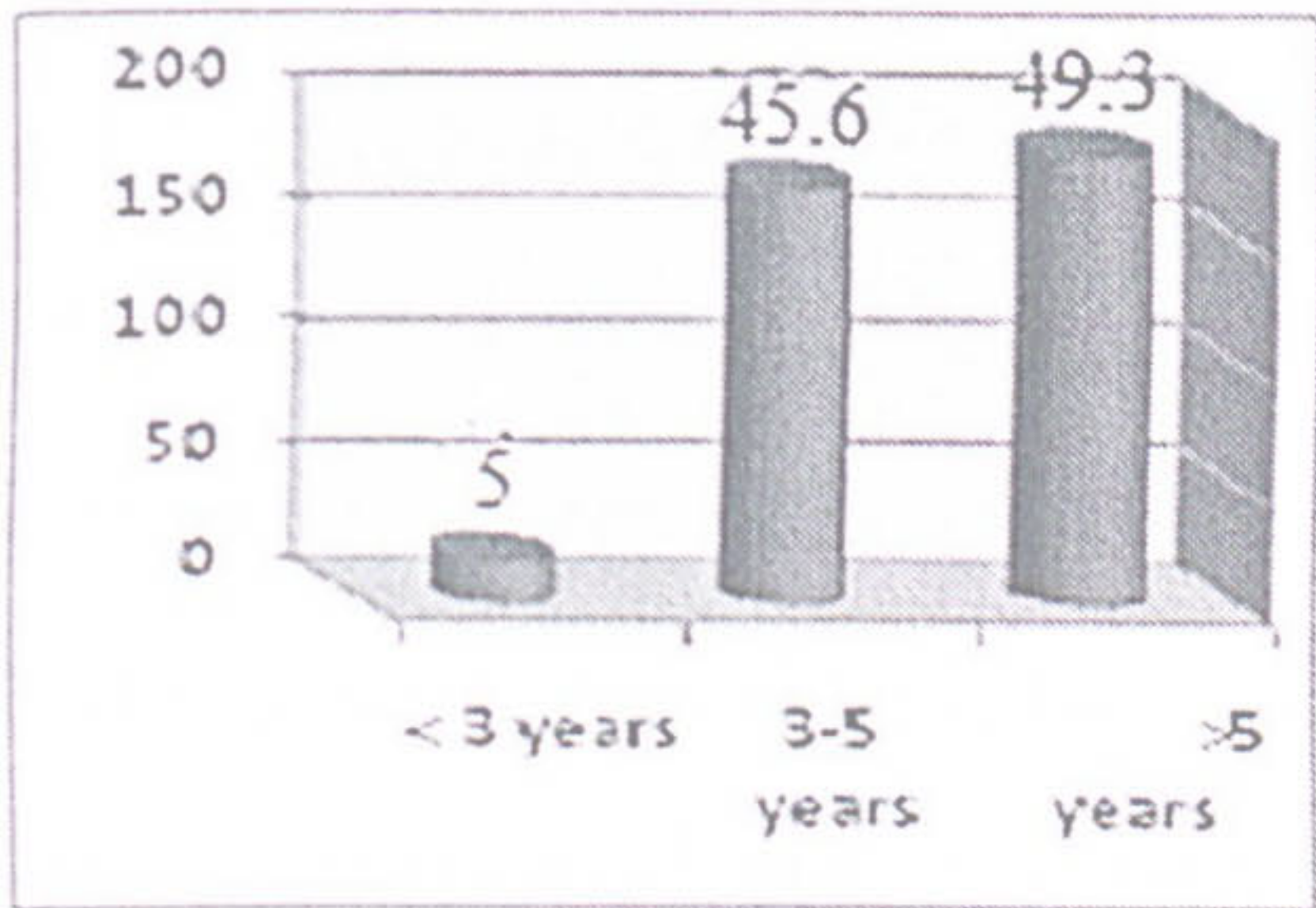


FIGURE 20: Students Computer Experience

Students Computer Experience	Frequency	Percent
< 3 years	19	5.0
3-5 years	173	45.6
>5 years	187	49.3
Total	379	100.0

4.3.3.7 Students' internet usage

The daily users of the Internet had the largest percentage with 57.8% followed by the weekly users with 39.6% and the monthly users of 2.6% (Table 33, Figure21).

TABLE 33: Respondents' internet usage

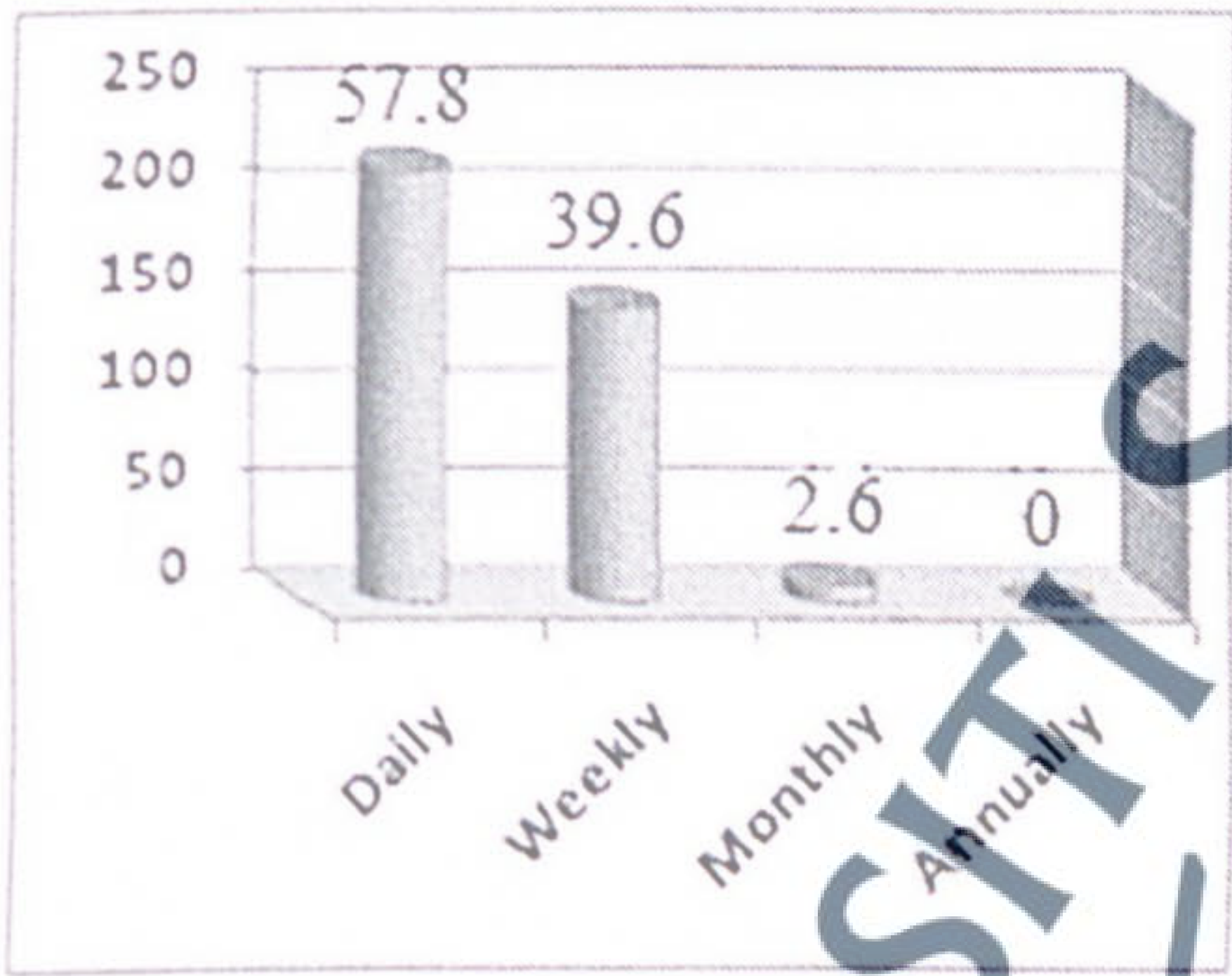


FIGURE 21: Respondents' internet usage

Respondents Internet Usage	Frequency	Percent
Daily	219	57.8
Weekly	150	39.6
Monthly	10	2.6
Annually	0	0
Total	379	100.0

4.3.4 Adoption of e-services in higher education in Benghazi university depend on awareness level

The majority of risks involved in e-services include lack of human awareness (knowledge and skills) necessary to plan, manage, and operate e- services West, Abdulrazzaq et al., (2003). Previous study by Nassraddeen, (2010) was aims to improve the general awareness of e- services by providing a set of guidelines that would help the Libyan' government' transition to an e- services environment by overcoming common challenges and problems. This chapter aims to evaluate

awareness as critical factor affecting successfully implementation of e-services in higher education in Libyan universities

4.3.4.1 Reliability test

The reliability test for Benghazi University has also been carried out using the Cronbach's coefficient alpha values. The internal consistency of the data is determined using the alpha values (Hinton et al., 2004; Field, 2005). The awareness of the e-services adoption in this university is very much similar to the results shown in the Tripoli University. It is found that there exists a 0.942 Cronbach's alpha which shows that excellent reliability levels exist. The intention and motivation factors for adoption of e-services had a value of 0.896 and the awareness of e- services had a value of 0.887 which showed high reliability (Table 34).

TABLE 34: Reliability of Measurements

Factor	Cronbach's Alpha (a)	Type	Standards of Reliability
Awareness of e- services	0.887	High reliability	0.70-0.90
Intention and motivation	0.896	High reliability	0.70-0.90
Adoption of e-services	0.942	Excellent reliability	≥ 0.90

4.3.4.2 Binary correlation test

Binary correlation testing has been carried out to examine the relationship between the demographic factors and the related or awareness factors with the adoption of e-services. The related factors would include the computer and internet, awareness of e-services of higher education and intention and motivation to use. In Benghazi, there is a significant positive correlation between the gender and specialization with adoption of e-services. These results are similar to those presented in the analysis of Tripoli University (Table 35). The study factors binary correlation states that there is a significant positive correlation present between the computer and internet familiarity,

awareness of e-services in higher education and motivation or intention with the adoption of e-services (Table 36).

TABLE 35: Correlations between demographic characters and e-services adoption in Benghazi university

Character	Adoption of e-services	Significant of correlation
Sex	.062	No correlation
	.211	No significant
	379	N
Age	.449**	High correlation
	.001	High significant
	379	N
Specialization	.021	No correlation
	.482	No significant
	379	N
Education	.416**	High correlation
	.001	High significant
	379	N

** Correlation is significant at the 0.001 level (2-tailed).

TABLE 36: Correlations between awareness, related factors and e-services Adoption

Factor	Adoption of e-services	Significant of correlation
Familiarity with the computer and internet	.859** .000 379	High correlation High significant N
Awareness of e-services of higher education	.898** .000 379	High correlation High significant N
Intention and motivation to use	.773** .000 379	High correlation High significant N

** Correlation is significant at the 0.001 level (2-tailed).

4.3.4.3 Regression analysis with all study factors

The regression analysis conducted had the adoption of e-services as the dependent variable and the study factors as the independent variables. The significant variables which affect the e-services adoption in higher education amongst the students of Benghazi have been analyzed through the regression analysis upon 379 students. Intention and motivation to use ($=.988, p < .000$), the availability of e-services ($=.975, p < .000$), awareness of e-services of higher education ($= .941, p < .000$), familiarity with the computer and internet ($=.862, p < .000$), and trust in ministry of higher education, technology and in e-services ($=.481, p < .000$) are the significant models of regression. On the other hand, the issue of privacy and risk ($= .022, p = .595$) do not have a significant positive relationship with the e-services adoption (Appendix A Table 10). Hence, the significant model is ($F (6, 379) = 209.339, p < 0.000$) with an R square of .835 (Appendix A Table 8,9). The results are very much similar to those of Tripoli University where the value of R square is 83.5% to the adoption of e-services changes. The remaining 16.5% are the rest of the unidentified factors.

4.3.4.4 Regression analysis with awareness and other related factors

Keeping the size of (β) in mind, the regression analysis of the awareness and other factors showed that intention and motivation to use has the strongest impact upon the variation of e-services adoption. Awareness of e-services of higher education and familiarity with the computer and internet follow after (Table 39). Hence, a significant model is presented ($F(3, 379) = 260.435, p < 0.000$) (Table 38) with an R square of .820 (Table 37). **TABLE 37:** Regression Analysis: Model Summary

Model	R	R Square	Adjusted R Square	Significant of correlation
1	.920**	.846	.843	High correlation

** Correlation is significant at the 0.001 level (2-tailed).

TABLE 38: Regression: Analysis ANOVA

Model	Sum of Squares	Mean Square	F	Sig.	Regression ANOVA
Regression	9.110	2.899	260.435	.000	High significant
Residual	4.589	.014			
Total	13.69				

High significant $P < 0.000$

TABLE 39: Regression Analysis: Coefficients

Factor	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	Significant of regression
	B	Beta			
Familiarity	.759	.801	4.831	.000	High significant
Awareness	.795	.868	5.721	.000	
Intention	.958	.906	6.88	.000	

High significant $P < 0.000$

4.3.4.5 Analysis of variance (ANOVA)

The mean differences of the answers provided by the students were measured through the significant differences in their answers with the help of variance. Significant differences ((F (7, 379) = 131.521, p < 0.000)) were observed with the help of the ANOVA analysis between the means of answers for the question of each factor. This includes intention and motivation to use and adopt e-services (Table40). With the help of these differences, it would be possible to understand the effect of awareness as the independent factor and motivation use of adoption of e-services as the dependent factors. The differences of mean of answers of students are presented in Table 11Appendix A.

TABLE 40: ANOVA

Factor		Sum of Squares	Mean Square	F	Sig.	Regression ANOVA
Adoption	Between Groups	10.268	1.467	131.52	.000	High significant
	Within Groups	4.138	.011			
	Total	14.406				
Intention	Between Groups	1.040	.149	708.63	.000	High significant
	Within Groups	.078	.000			
	Total	1.118				

High significant P< 0.000

4.3.5 Respondents’ profile of Omar Al-Mukhtar university

400 Libyan students of Omar AL-Mukhtar university were provided with questionnaires on the 1st of December 2013 and were to be collected by the end of March 2014. Out of these 400, 392 questionnaires were collected out of which 15 responses had to be discarded. This was mainly because the some of the answers were vague or incomplete. Hence, 377 responses were used for analysis.

4.3.5.1 Gender of respondents

The female participants of this university were 50.7% which is very much close to the male number of 49.3% (Table 41, Figure 22).



FIGURE 22: Gender of Respondents

TABLE 41: Gender of Respondents

Gender	Frequency	Percent
Male	186	49.3
Female	191	50.7
Total	377	100.0

4.3.5.2 Age of participants

Most of the students from the Omar AL-Mukhtar University are part of the 19-29 years (52.3%) and 30-40 years (45.9%) of age. This is presented in the table and figure below. Greater than 40 years of age was only 1.9% (Table 42, Figure 23).

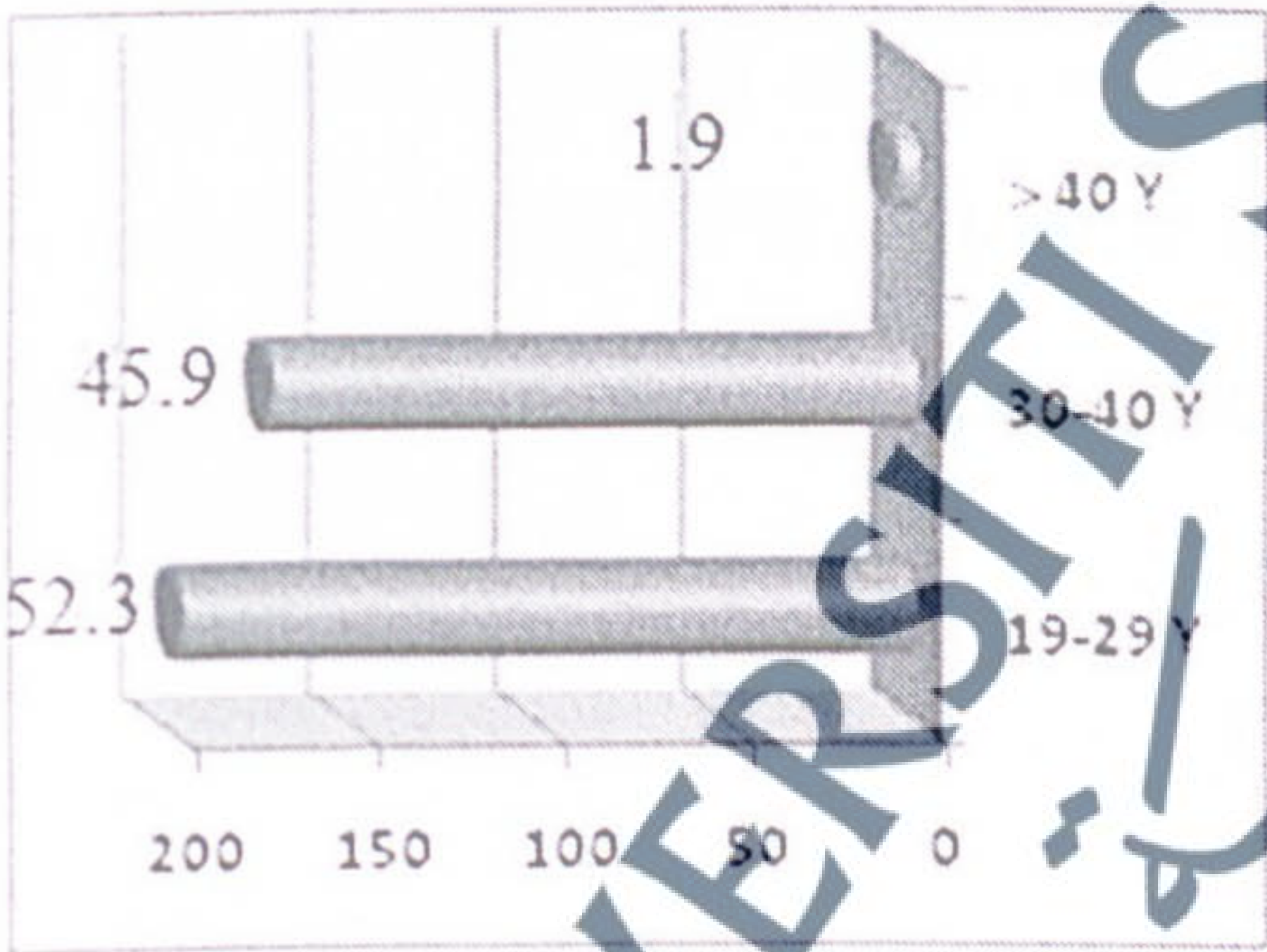


FIGURE 23: Age of Respondents

TABLE 42: Age of Respondents

The Age Groups	Frequency	Percent
19-29 Years	197	52.3
30-40 Years	173	45.9
>40 Years	7	1.9
Total	377	100.0

4.3.5.3 Professional backgrounds of participants

The highest percentage of individuals with an economic and mathematics professional background was 29.4% followed by the computer and engineering (26.0%), medical and biology (23.3%) and literary (21.2%), (Table 43, Figure 24).

TABLE 43: Professional Background of Students

professional background	Frequency	Percent
Computer and engineering	98	26.0
Economic and mathematics	111	29.4
Medical and biology	88	23.3
Literary	80	21.2
Total	377	100.0

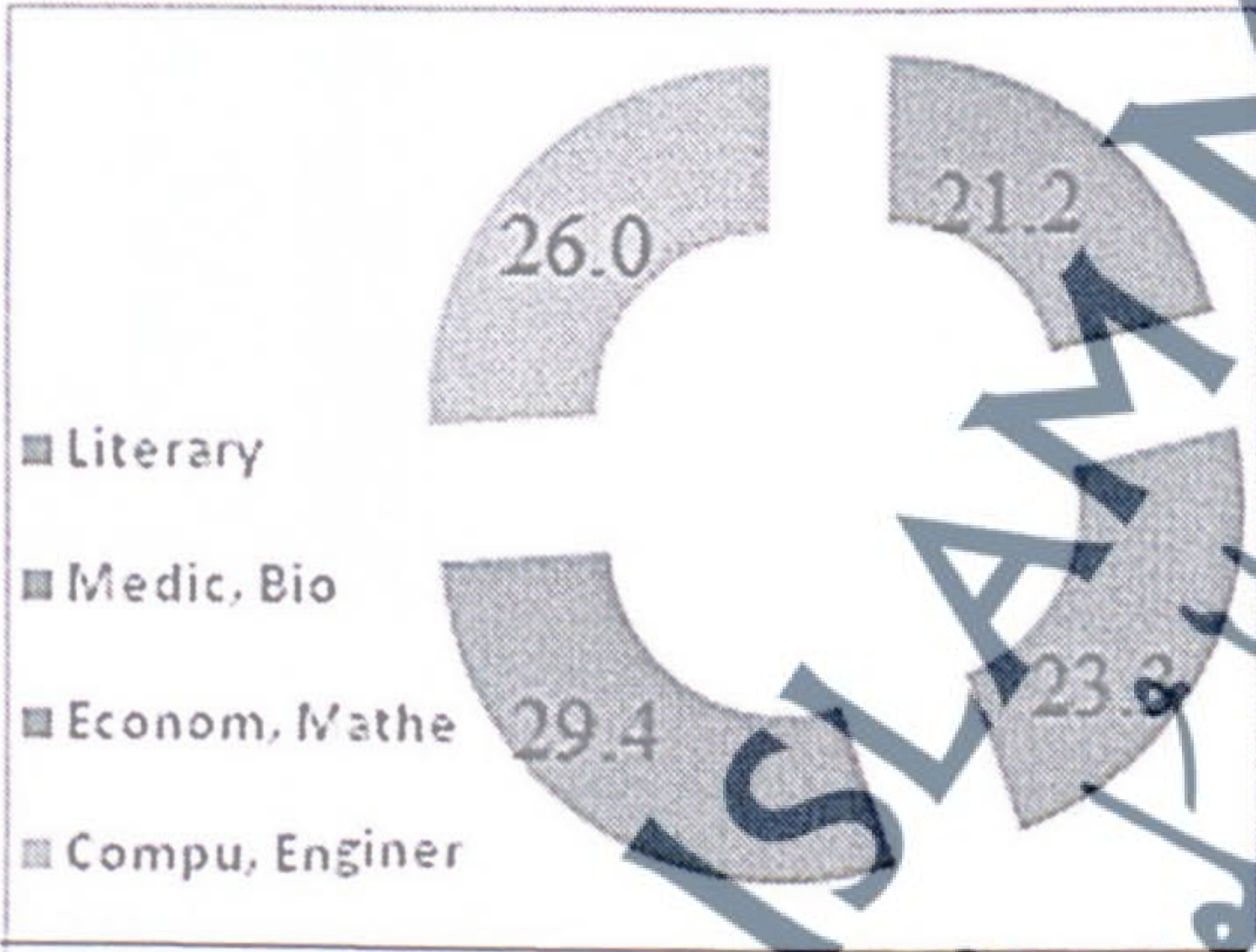
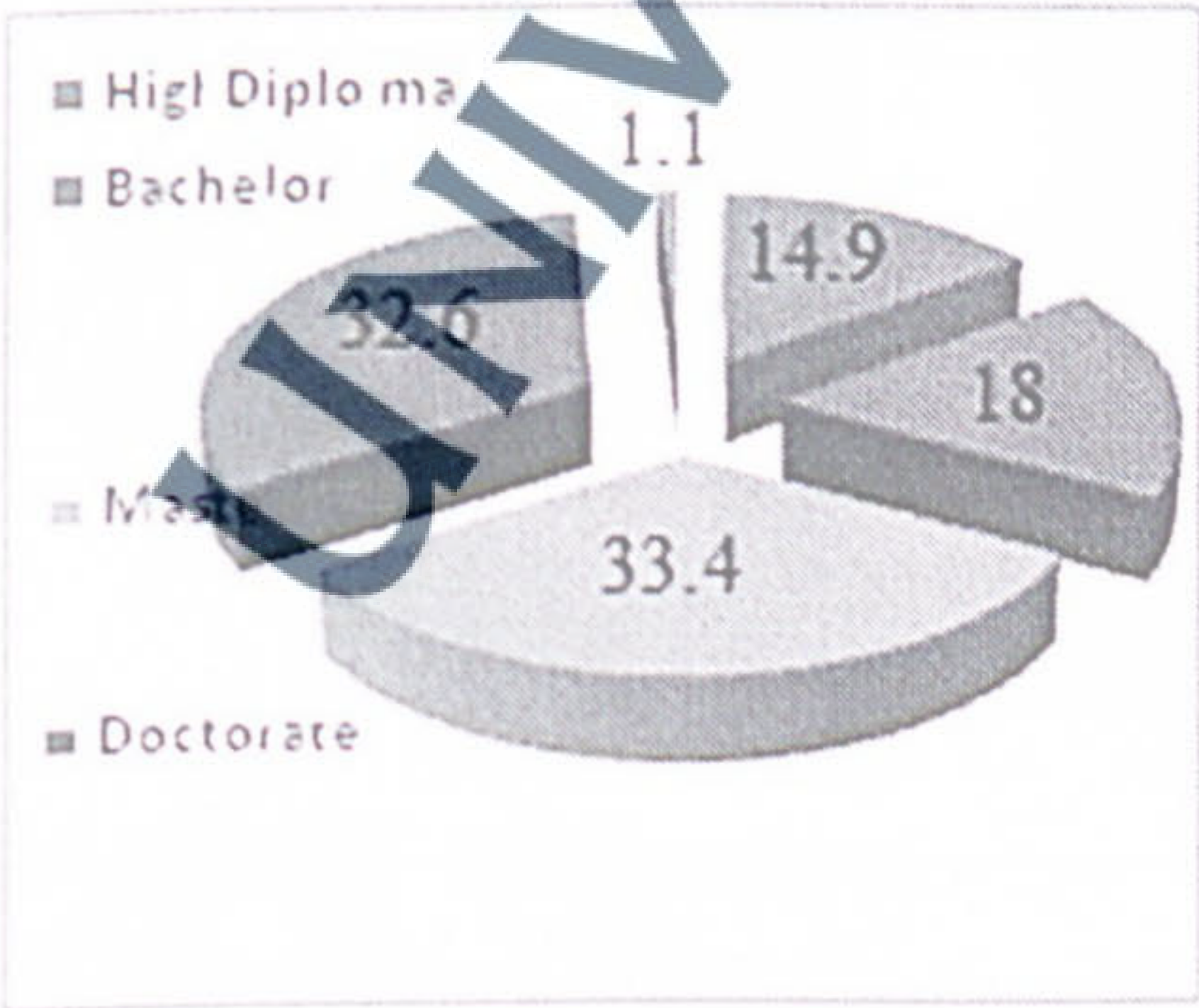


FIGURE 24: Professional background of Students.

4.3.5.4 Educational background

Majority of students of this university are engaged in the Masters program since the percentage is 66.04% followed by the PHD program with 32.6%, bachelor 18.0%, higher diploma 14.9% and post doctorate 1.1% (Shown in table 44, figure 25).

TABLE 44: Educational Background of Respondents



Education	Frequency	Percent
post DR	4	1.1
Doctorate	123	32.6
Master	126	33.4
Bachelor	68	18.0
high diploma	56	14.9
Total	377	100.0

FIGURE 25: Educational Background of

4.3.5.5 Students internet experience

The internet experience of the students showed that 68.70% of the students have been using the internet for over 4 years followed by 25.46% of students with 3-4 years, 5.84% of students used the internet for 1-2 years (Table 45, Figure 26).

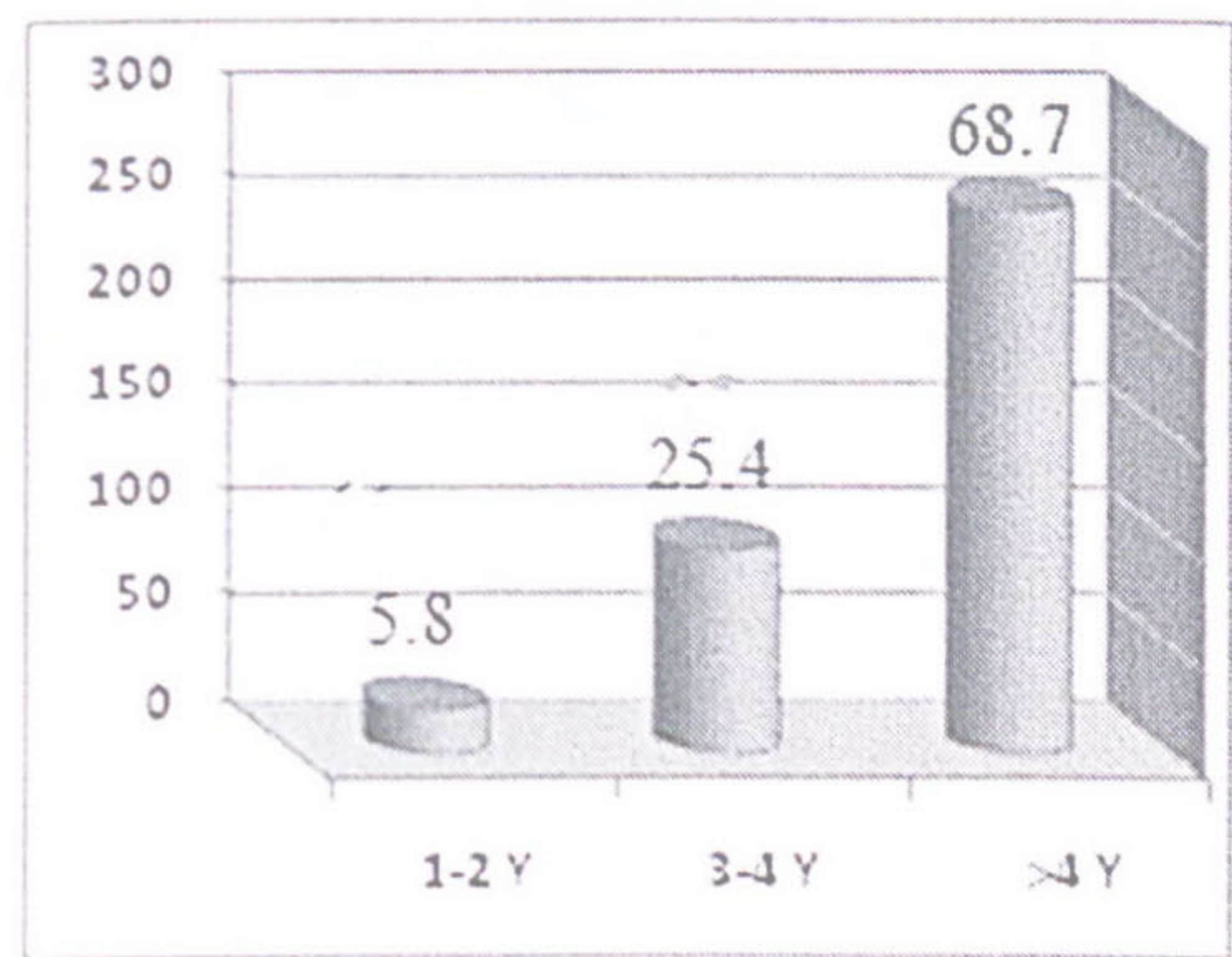


FIGURE 26: Students Internet Experience

TABLE 45: Students Internet Experience

Students	Internet Experience	Frequency	Percent
	1-2 years	22	5.84
	3-4 years	96	25.46
	>4 years	259	68.70
	Total	377	100.0

4.3.5.6 Students' computer experience

The experience of using computers for the students was analyzed which showed that 95.49% of the students have computer experience since 3-5 years out of which 49.6% for more than 5 years and 45.9% for 3-5 years. Only 4.5% of the students have computer experience less than 1-2 years (Table 46).

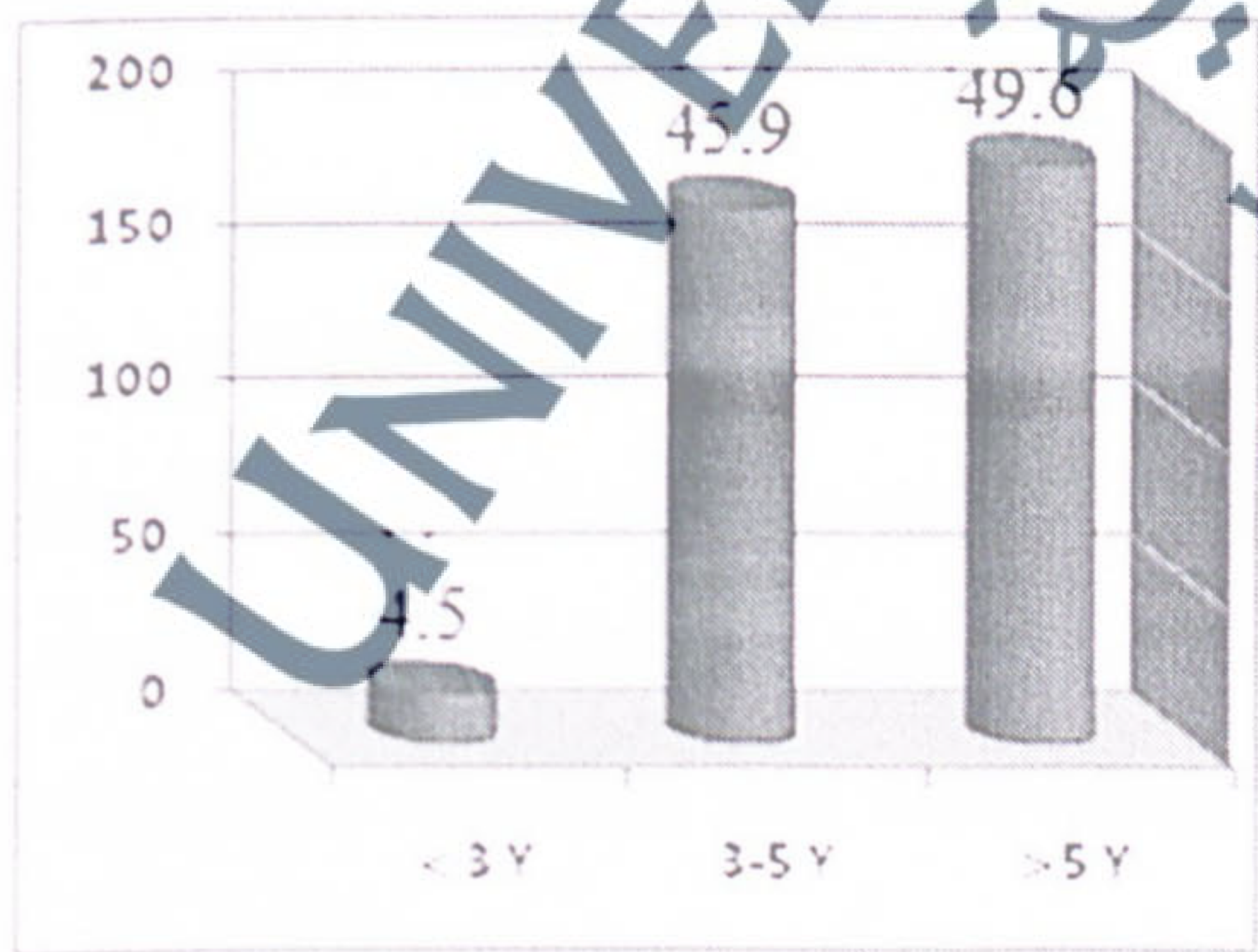


FIGURE 27: Students Computer Experience

TABLE 46: Students Computer Experience

Students	Computer Experience	Frequency	Percent
	< 3 years	17	4.5
	3-5 years	173	45.9
	>5 years	187	49.6
	Total	377	100.0

4.3.5.7 Students' internet usage

The daily use of the Internet by the respondents is 57.6% and those who use it weekly are 39.8%. The students who use it monthly are 2.7% (Table 4 , Figure28).

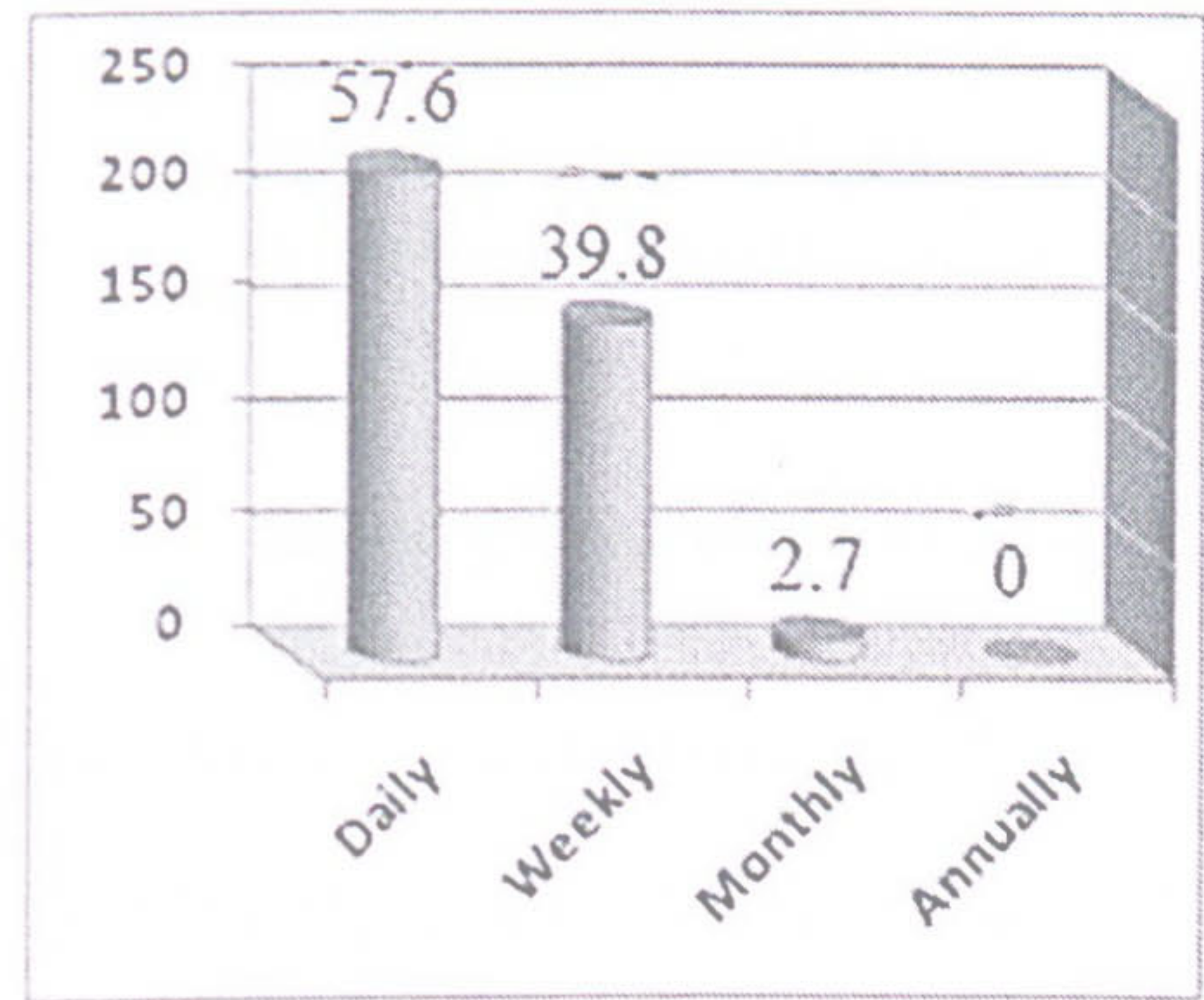


FIGURE 28: Respondents' Internet usage

TABLE 47: Respondents 'Internet Usage

Respondents 'Internet Usage	Frequency	Percent
Daily	217	57.6
Weekly	150	39.8
Monthly	10	2.7
Annually	0	0
Total	377	100.0

4.3.6 Adoption of e-services in higher education in omar al-mukhtar university depend on awareness level

The majority of risks involved in e-services include lack of human awareness (knowledge and skills) necessary to plan, manage, and operate e- services West, Abdulrazzaq et al., (2003). Previous study by Nassraddeen, (2010) was aims to improve the general awareness of e- services by providing a set of guidelines that would help the Libyan' government' transition to an e- services environment by overcoming common challenges and problems. This chapter aims to evaluate awareness as critical factor affecting successfully implementation of e-services in higher education in Libyan universities.

4.3.6.1 Reliability test

Excellent reliability was found when the tests were conducted to check the effect of awareness on e-services adoption. This can be determined by the Cronbach's alpha of 0.936. The intention and motivation is of 0.923 which also shows excellent reliability along with awareness of e- services with Cronbach's alpha of 0.885 showing high reliability (Table 48).

TABLE 48: Reliability of Measurements

Factor	Cronbach's Alpha (a)	Type	Standards of Reliability
Awareness of e- services	0.885	High reliability	0.70-0.90
Intention and motivation	0.923	Excellent reliability	≥ 0.90
Adoption of e-services	0.936	Excellent reliability	≥ 0.90

4.3.6.2 Binary correlation test

The binary collection method was used to check the relationship between the awareness, demographic characters and related factors with e-services adoption. The related factors include awareness of e-services of higher education and intention and motivation to use and familiarity with the computer and internet. A significant positive correlation was found between the demographic characters such as age or education with the adoption of e-services. However, the gender or specialization of the respondents did not have a significant relationship with e-services adoption. The respondents of Benghazi and Tripoli also stated similar answers (Table 49). A significant positive correlation was also found between awareness and related factors with the e-service awareness of higher education, computer and internet familiarity, intention and motivation for use and adoption of e-services (Table 50).

TABLE 49: Correlations between Demographic Characters and e-services Adoption in Omar AL-Mukhtar university

Character	Adoption of e-services	Significant of correlation
Sex	.065	No correlation
	.207	No significant
	377	N
Age	.448**	High correlation
	.001	High significant
	377	N
Specialization	.037	No correlation
	.474	No significant
	377	N
Education	.359**	High correlation
	.001	High significant
	377	N

** Correlation is significant at the 0.001 level (2-tailed).

TABLE 50: Correlations between awareness, related factors and e-services Adoption

Factor	Adoption of e-services	Significant of correlation
Familiarity with the computer and internet	.879**	High correlation
	.001	High significant
	377	N
Awareness of e-services of higher education	.924**	High correlation
	.001	High significant
	377	N
Intention and motivation to use	.825**	High correlation
	.001	High significant
	377	N

** Correlation is significant at the 0.001 level (2-tailed).

4.3.6.3 Regression analysis with all study factors

To conduct the regression analysis, e-services adoption was stated as the dependent variable and the independent variables were the study factors. Omar AL-Mukhtar University is situated in AL-Beadah city from which 337 responses have been collected. The regression model was applied upon these responses and the significant variables which affect adoption of e-services in higher education of the university students were tested. Intention and motivation to use ($=.986, p < .000$), the availability of e-services ($=.984, p < .000$), awareness of e-services of higher education ($= .933, p < .000$), familiarity with the computer and internet ($=.840, p < .000$), and trust in ministry of higher education, technology and in e-services ($=.420, p < .000$) were considered as the significant variables. On the other hand risk predict and issue of privacy ($= .595, p = .015$) are found to have no significant effect upon the e-services adoption (Appendix A Table 14). Hence, the significant model is ($F (6, 377) = 202.189, p < 0.000$) with an R square of .912 (Appendix A Table 12,13). The value of R square is 91.2% to the changes in the adoption of e-services similar to the results of the Tripoli and Benghazi universities. The remaining 8.8% are the unidentified factors present.

4.3.6.4 Regression analysis with awareness and other related factors

When regression analysis was conducted using the awareness and other related factors, the intention and motivation for use was kept as the significant variable since it had a strong effect upon the e-services adoption. Awareness of e-services of higher education and familiarity with the computer and internet also had an effect. Through this analysis a significant model emerged which is ($F (3, 377) = 200.203, p < 0.000$) (Table 52) with an R square of .820 (Table 51) and significant variables (Table 53)

TABLE 51: Regression analysis: Model Summary

Model	R	R Square	Adjusted R Square	Significant of correlation
1	.935**	.847	.845	High correlation

** Correlation is significant at the 0.001 level (2-tailed).

TABLE 52: Regression: analysis ANOVA

Model	Sum of Squares	Mean Square	F	Sig.	Regression ANOVA
Regression	8.885	2.962			
Residual	5.518	.015	200.203	.000	High significant
Total	14.403				

High significant P< 0.000

TABLE 53: Regression analysis: Coefficients

Model	Unstandardized Coefficients	Standardize Coefficients	t	Sig.	Significant of regression
	B	Beta			
Familiarity	.380		1.995	.000	
Awareness	.784	.820	5.522	.000	High
Intention	.818	.883	6.00	.000	significant
	.987	.934	7.74	.000	

High significant P< 0.000

4.3.6.5 Analysis of variance (ANOVA)

Each factor for the answers provided by the Omar AL-Mukhtar university respondents showed a significant difference between the means of these answers in the analysis of variance ((F (7, 377) = 130.772, p < 0.000)) (Table54). Awareness is used as an independent factor and it has a clear effect upon the dependent factors which are

motivation and intention for use and e-services adoption. The mean answers of student differences in presented in Table 15 Appendix A.

TABLE 54: ANOVA

Relation between factors	Sum of Squares	Mean Square	F	Sig.	Regression ANOVA
Between	10.265	1.466	130.772	.000	High significant
Groups	4.138	.011			
Within Groups	14.403				
Total					
Between	1.040	.149	704.741	.000	High significant
Groups	.078	.000			
Within Groups	1.118				
Total					

High significant $P < 0.000$

4.4 The difference between the results of the pilot and real study

From this study it can be deduced that, there were some differences between the pilot and real study. All reliability measurements have higher value for each factor in the real study (which has been calculated at 0.894 for awareness of e-services, 0.910 for intention and motivation, 0.895 for availability of e-services, 0.822 for trust in electronic services, 0.757 for risk predict and privacy and 0.948 for adoption of e-services) compared with the pilot study (which has been calculated at 0.773 for awareness of e-services, 0.905 for intention and motivation, 0.751 for availability of e-services, 0.745 for trust in electronic services, 0.726 for risk predict and privacy and 0.887 for adoption of e-services). This may refer to the size of the real study sample that was bigger than the size of the pilot study sample.

4.5 Discussion

Libya faces many challenges in implementing this technology for its educational systems, workplaces or even at home. In order to understand these issues, a survey study was conducted which would analyze the implementation success of e-services in 3 of the well known universities of the state. 1200 participants were taken into account and provided with the survey.

The three universities showed similar results where the number of male and female respondents was also approximate. This study indicated that, the number of male and female respondents were equally, the reason may be due to having the same level of awareness and willingness to use electronic services of both sexes. In addition the students of this study are in higher education level, so they have a higher level of awareness of e-services compared with the previous study by Nassraddeen, (2010) which focus on high school students. His study (paper based survey) state that there is a gender imbalance present when such survey are conducted. The studies believed that usually 91.3% of the respondents were male, and only 8.7% of respondents were Female.

In each of the universities, the largest percentage of the respondents were part of the 19-29 years ages group and the second largest group was the 30 to 40 years age

group. There were only a few respondents which lied in the greater than 40 group. This study suggested that, most participants were relatively young and middle-aged adults . Because they are naturally higher education students. Previous studies, however, indicate that mostly students were from 19-25 years or more than 66 years. A typical respondent was found to be within the age group of 36-45, 46-55 and 56-65year but there were some under the age of 18 as well (Nassraddeen, 2010). The studies present in literature cannot be compared to the present study at hand since they take into account the entire state and the present study only focuses on individuals receiving higher education in Libyan Universities.

The finding of professional background showed that, there were approximate percentage of different specializations in each university. This because of the random distribution of a questionnaire among students from different universities and different specializations. The sample selected by Nassraddeen (2010) was from the general population and it included primary and high school student, undergraduate students along with farmers and engineers.

As part of this survey research, it was observed that majority of the students are part of the masters program or the PH.D level program. Only 33% of the students were receiving the bachelor or high diploma and 2% were part of the post doctorate program. The number of master and doctoral students was the largest , compared with Nassraddeen's study , (2010) which had a lower number of master and doctoral students . This is because the sample of this study was limited to higher education students only, while the sample of Nassraddeen's study was not limited to higher education students , but it also included students in high schools and staff. His study have taken into account high school and degree level Libyan students for his research.

As part of this research, it can be said that most of the students receiving education at universities contain a background experience of using the internet. 69% of these respondents had been using the Internet for over 4 years and 26% have been using it since 3 to 4 years. This study included the largest number of students who have used the Internet for more than 4 years, In comparison, Nassraddeen's study , (2010)

included the largest number of Internet users for 2-5 years and the lowest percentage of Internet users was from Category of users who have used the internet for more than 5 years. The reason is that the study sample was limited to students of higher education and included the largest number of postgraduate students who have used the Internet for a longer time in different study levels compared with Nassraddeen's sample which was mostly from high schools, undergraduate students and staff who have used the Internet for a shorter time in their studies. Nassradeen (2010), found that his respondents were only 46% who had been using the internet between 2 to 5 years, 29.3% for above 6 years and about 10.1% for above 10 years (specifically the ones studying abroad). Only 14% used the Internet for less than 2 years. In Libya, many of the professionals like lecturers, medical doctors etc were provided with the opportunity to use the internet at an earlier time. Individuals of this nation who were studying abroad had earlier exposure of this opportunity. Hence, it can be said that education plays a vital role in creating awareness of e- services and implementing it in the nation (Abdulrazzaq et al., 2003).

When discussing the experience of students in using the computer it was extracted from the samples of all 3 universities that 95% of the students had an experience of over 3-5 years. compared with the previous studies, the highest percentage of students was from who have used computer for more than 5 years, due to the sample of study that was limited to higher education students, while study of Nassraddeen (2010) don't focus on higher education students, but extended to high school students and staff. Studies in literature show that 28.5% of the total students was found to have typical knowledge of this technology and 28.0% had more than the typical knowledge. Advanced computer skills were present in 34.3% of the respondents followed by the 8.8% of the beginners or basic capabilities individuals. Hence, nearly 81% of the respondents consisted of the basic computer skills required (Nassraddeen 2010).

The terms of frequency in the survey analysis shows that students of all 3 universities had the largest group of the daily users with 58%. The smallest group observed was the weekly users with 39.6% followed by monthly user with 2.6%. This study showed that the percentage of the daily use of the Internet was high because of

the study sample that have focused on masters, doctoral and bachelor students who have used the Internet constantly in their researches and assignments and preparation of lectures. Nasseruddin, (2010) study present in literature states that daily internet users are 62.9%, 3 to 4 times a week users are 26.3% and once a week users are 9.6%. The technology is required by the students of Libya even though there is limited access present in the universities, household or work places. Hence, it is required that the internet be made available to the individuals by increasing infrastructure, creating awareness of the e-services and training (Abdalmohsen, 2005). The time duration observed for the respondents using the Internet who have access is 84.7% users for less than 5 hours (Nassraddeen, 2010).

The same construct measurement reliability can be analyzed using Cronbach's value of construct scores, the higher the value, the higher the reliability. The three university results for reliability state that excellent reliability is present for the factor of adoption of e-services in higher education in Libya. The intention and motivation for use and the awareness of e-services and technology are followers. This finding of this study confirmed that the high alpha values of the awareness of e-services indicates that, the awareness of e-services were internally consistent. Consequently, the awareness of e-services is reliable and the higher the alpha (α) value, the higher the reliability of awareness of e-services. The internal consistency method used by Nassraddeen (2010) provides a clear picture of the level of reliability for the given test. For the overall measurement of reliability, he observed that Cronbach's alpha value was .826 for the SPSS output. Hence, it can be said that both the sample scales are reliable for use.

The binary correlation applied to all 3 universities helped present a relationship between the demographic characters, awareness or related factors with the adoption of e-services. A significant and positive relationship was present between the educational level, age, awareness, motivation and familiarity of use of the computer and internet with the e-services adoption for all universities. There is a significant correlation between the age or the level of education and the adoption of e-services. Due to that middle-age adults (30-40 years) are mostly masters and doctoral students who have a

higher level of awareness compared with other age groups. This is also the case for higher educational levels (postgraduate students) are the most students who have adopted e-service . On other hand, there is no significant correlation between the gender or specialization and the adoption of e-services. because both males and females can be equally adopts e-services if they have the same level of awareness. As well as this is the case for students with different specializations. They can have the same level of e-services adoption. There is also a significant correlation between study factors (familiarity with the computer and internet, awareness of e-services of higher education and intention and motivation to use) and the adoption of e-services. Due to that the greater the level of computer and internet experience, the greater the awareness of e-services. Thus increasing the intention and willingness to e-services adoption. The research in literature by Al-Shafi, (2009) also showed that a strong correlation between genders, age, other factors and educational levels also have a strong correlation with e-services adoption. The other factors in his study include the Social influence, Effort expectancy and the performance expectancy.

Regression analysis was also conducted upon the data presented by the respondents of the 3 institutions. It revealed that Intention and Motivation are able to create a sound effect on the adoption of e-services in higher education in Libya. This is followed by the awareness of e-services of higher education, familiarity with the computer and internet and trust in ministry of higher education, technology and e-services. The higher the values of regression, the stronger the relationship between study factors (familiarity with computer and internet, awareness of e-services of higher education and intention and motivation to use) and the adoption of e-services. This indicates that, the more the experience in the computer and the internet, the more the awareness. Thus, increasing the intention to use and adoption of e-services. The results presented by Al-Shafi, (2009) state a strong and significant positive relationship between the social influence, performance expectancy and behavioural intentions in implementing or using the e- services being offered.

Each university was subjected to the analysis of variance. The finding showed that, a significant difference of the answers' mean of questions for each factor. Intention and motivation to use were used as the independent factors to check the

effect of awareness in e-services adoption. The analysis of variance results indicate the existence of a relationship between the awareness of e-services as an independent factor and intention to use and adoption of e-services as a dependent factor. That's mean the more the awareness, the more the intention adoption of e-services. This can be observed from the significant differences between the means of the questions' answers for each factor between groups and within groups.

4.6 Conclusion

This study concluded that, the awareness level of e-services of students from higher education studying at various educational levels in different universities was very high.