

CHAPTER - 3

RESEARCH METHODOLOGY

The analysis of the pilot study, a description of the constructs, a description of the statistical tools and methodologies utilised for analysis, as well as a conceptual framework for testing the hypothesis, are all covered in length in this chapter.

3.1 Summary of the Research design

A research design is the conceptual framework for the study that a researcher is considering. It helps give the research direction and gives the researcher guidance when collecting data. As a result, the phase that follows the formulation of the hypotheses is considered to be of utmost importance. It lays out in great detail how the acquired data will be used to test the hypothesis. Below is a summary of the research design in its entirety, as seen in Table 3.1.

Management students from Jaipur, Rajasthan, were potential respondents for this study. The researcher has contacted numerous management colleges in Jaipur, including but not limited to St. Xavier's College, Jagan Institutes of Management Studies, and International School of Informatics and Management Technical Campus (IIIM). A pilot study using a 60-person sample has been conducted. The main study's sample size was 343 respondents. Both a field visit and an online survey were used to collect data.

Table 3.1: Summary of the Research Design

S.no.	Particulars	Details
1.	Potential respondents	Management students
2.	Source of a sample frame	Management colleges in Jaipur
3.	Sampling Method	Simple Random Sampling
4.	Size of the Pilot Study's Sample	60
5.	Size of the Main Study's Sample	343
6.	Sample size used for the primary analysis in the study	343
7.	Technique Used to Collect Data	Online survey and Field schedule
8.	Statistical technique	Multiple linear regression, Pearson correlation coefficient
9.	Statistical tools	SPSS 20

3.2 Sample and Data Collection

Management students from Jaipur, Rajasthan, served as the study's respondents. The sampling method used was a straightforward random sampling method. With this method, each population item has an equal chance and likelihood of being chosen for the sample. Choice is solely based on chance, or probability. As a result, it is also referred to as the "technique of chances."

The list of students provided by various departments of management colleges and institutes was used to create a sample frame, which was then used to collect the sample for the current study. Each name on the list is given a number. Finally, a sample frame was created by selecting random numbers.

Data was gathered between March 2020 and May 2020 using a field schedule and an online survey. A total of 360 replies in all came from management students in various semesters. Only 345 of the 360 responses were taken into consideration for analysis

because a small number of the respondents answered few questions and provided utterly irrelevant answers, which led to significant outliers. The table below provides information about data collection. In order to receive an honest response without any reluctance, personal information like the student's name and GPA was not made mandatory.

Table 3.2: Sources of Data collection

Particulars	Total Collection of Data	Out of collected Data- Data used for analysis
Online Survey	243	240
Field visiting	100	100
Total	343	340

3.3 DATA CODING

Responses gathered through online questionnaires and field schedules were coded for statistical analysis. There were numerical codes used for continuous scaling. While string variables were utilised for names, email addresses, etc.

3.4 DATA PREPARTION AND HANDLING

Out of the total responses gathered, some were incomplete. The average values for the missed responses were used to ensure bias-free research. The data was prepared for statistical analysis after managing the missing data. Even though missing data were dealt with, certain responses could not be used in statistical analysis because they were irreverent and produced a significant outlier. As a result, only 340 of the 343 responses were used for the main study.

3.5 ESTIMATING THE SAMPLE SIZE

Students enrolled in postgraduate (MBA) programmes in Jaipur, Rajasthan, make up the sample size. According to the All India Council for Technical Education (AICTE)

2018–19 report, Jaipur has a significant concentration of MBA institutions and universities that offer MBA degrees, accounting for 3164 of the state's management students. As a result, Jaipur is a viable option for the sample size.

3.5.1 Sample Size

Cochran's Sample Size Formula

The Cochran formula is:

$$n_0 = \frac{z^2 pq}{e^2}$$

Where:

- e is the desired level of precision (i.e. the margin of error)
- p is the (estimated) proportion of the population which has the attribute in question
- q is 1-p

The Z-value is found in Z table (1.96 for 95%)

So here:

$$p = 0.5$$

$$e = \pm 5\% \text{ or } 0.05$$

$$n_0 = \frac{1.96^2(0.5)(0.5)}{0.05^2} = 385$$

3.5.2 Modification for the Cochran Formula for Sample Size:

If the population we're studying is small, we can modify the sample size we calculated in the above formula by using this equation:

$$n = \frac{n_0}{1 + \frac{(n_0-1)}{N}}$$

Here:

n_0 = Cochran's sample size recommendation

N = Population Size

n = new adjusted sample size

So,

$$n_0 = 385$$

$$N = 3164$$

$$n = \frac{385}{1 + \frac{(385-1)}{3164}}$$
$$= 343$$

Hence, the desired sample size is 343 for this study.

3.6 PILOT STUDY

A pilot study was carried out between August 2019 and December 2019 with a sample of 60 respondents after structuring the draught questionnaire based on scales and the prior literature analysis. Surveys were distributed, and after a few follow-ups, responses were gathered using a Google form and field visits.

Through the use of SPSS, the Cronbach's alpha test was used to determine the statements' reliability. The internal consistency of attitudinal statements that are related to a latent variable or construct is captured by Cronbach's alpha. The range of the Cronbach alpha value is 0 to 1. The questionnaire's internal consistency or reliability is improved by the higher value indicated.

Based on the critical values for evaluating internal consistency, the statements with Cronbach's alpha values of less than 0.7 were disregarded, and the claims with values of 0.07 or higher were taken into consideration for the main research. The detailed SPSS output of the pilot study, which was produced after the statements with Cronbach's alpha values of less than 0.7 were eliminated, is shown below.

3.6.1 Media and technology usage scale (MTUAS)

3.6.1.1 Internal Consistency among indicators of E-Mailing

Reliability Statistics	
Cronbach's Alpha	N of Items
.833	3

Case Processing Summary			
		N	%
Cases	Valid	60	100.0
	Excluded ^a	0	.0
	Total	60	100.0

Item-Total Statistics				
	If Item Is Removed, Scale Mean	Deleted Item Scale Variance	Item-total correlation that has been fixed	If an item is deleted, Cronbach's Alpha
Q1	13.40	4.854	.768	.698
Q2	13.22	4.579	.729	.733
Q5	13.62	5.359	.593	.864

3.6.1.2 Internal consistency among indicators of text messaging

Reliability Statistics	
Cronbach's Alpha	N of Items
.732	3

Case Processing Summary			
		N	%
Cases	Valid	60	100.0
	Excluded ^a	0	.0
	Total	60	100.0

Item-Total Statistics				
	If Item Is Removed, Scale Mean	Deleted Item Scale Variance	Item-total correlation that has been fixed	If an item is deleted, Cronbach's Alpha
Q3	10.20	12.332	.426	.349
Q4	10.30	12.790	.482	.318
Q7	13.37	7.728	.266	.747

3.6.1.3 Internal consistency among indicators of Smartphone Usage

Reliability Statistics	
Cronbach's Alpha	N of Items
.692	2

Case Processing Summary			
		N	%
Cases	Valid	60	100.0
	Excluded ^a	0	.0
	Total	60	100.0

Item-Total Statistics				
	If Item Is Removed, Scale Mean	Deleted Item Scale Variance	Item-total correlation that has been fixed	If an item is deleted, Cronbach's Alpha
Q6	6.75	3.377	.550	.
Q8	6.43	1.911	.550	.

3.6.1.4 Internal consistency among indicators of Media Sharing

Reliability Statistics	
Cronbach's Alpha	N of Items
.716	2

Case Processing Summary			
		N	%
Cases	Valid	60	100.0
	Excluded ^a	0	.0
	Total	60	100.0

Item-Total Statistics				
	If Item Is Removed, Scale Mean	Deleted Item Scale Variance	Item-total correlation that has been fixed	If an item is deleted, Cronbach's Alpha
Q11	3.42	4.688	.558	.
Q12	4.05	4.421	.558	.

3.6.1.5 Internal consistency among indicators of Internet Searching

Reliability Statistics	
Cronbach's Alpha	N of Items
.773	3

Case Processing Summary			
		N	%
Cases	Valid	60	100.0
	Excluded ^a	0	.0
	Total	60	100.0

Item-Total Statistics				
	If Item Is Removed, Scale Mean	Deleted Item Scale Variance	Item-total correlation that has been fixed	If an item is deleted, Cronbach's Alpha
Q13	12.20	8.400	.603	.699
Q14	10.98	7.847	.628	.670
Q15	12.12	8.105	.592	.711

3.6.2 SRSSDL:

3.6.2.1 Internal consistency among indicators of Awareness

Reliability Statistics	
Cronbach's Alpha	N of Items
.719	5

Case Processing Summary			
		N	%
Cases	Valid	60	100.0
	Excluded ^a	0	000.0
	Total	60	100.0

Item-Total Statistics				
	If Item Is Removed, Scale Mean	Deleted Item Scale Variance	Item-total correlation that has been fixed	If an item is deleted, Cronbach's Alpha
S1	14.65	6.570	.421	.552
S2	14.97	6.507	.170	.688
S3	14.57	5.640	.619	.451
S4	15.07	5.860	.350	.581
S5	14.35	6.096	.423	.541

3.6.2.2 Internal consistency among indicators of Learning Strategies

Reliability Statistics	
Cronbach's Alpha	N of Items
.769	4

Case Processing Summary			
		N	%
Cases	Valid	60	100.0
	Excluded ^a	0	.0
	Total	60	100.0

Item-Total Statistics				
	If Item Is Removed, Scale Mean	Deleted Item Scale Variance	Item-total correlation that has been fixed	If an item is deleted, Cronbach's Alpha
S6	13.05	3.404	.337	.682
S7	12.12	3.054	.579	.516
S8	12.58	3.129	.466	.592
S9	12.50	3.508	.441	.610

3.6.2.3 Internal consistency among indicators of Learning Activities

Reliability Statistics	
Cronbach's Alpha	N of Items
.786	3

Case Processing Summary			
		N	%
Cases	Valid	60	100.0
	Excluded ^a	0	.0
	Total	60	100.0

Item-Total Statistics				
	If Item Is Removed, Scale Mean	Deleted Item Scale Variance	Item-total correlation that has been fixed	If an item is deleted, Cronbach's Alpha
S10	7.62	2.105	.509	.580
S11	7.43	2.114	.552	.524
S12	7.72	2.376	.441	.665

3.6.2.4 Internal consistency among indicators of Evaluation

Reliability Statistics	
Cronbach's Alpha	N of Items
.765	4

Case Processing Summary			
		N	%
Cases	Valid	60	100.0
	Excluded ^a	0	000.0
	Total	60	100.0

Item-Total Statistics				
	If Item Is Removed, Scale Mean	Deleted Item Scale Variance	Item-total correlation that has been fixed	If an item is deleted, Cronbach's Alpha
S13	12.10	4.092	.251	.737
S14	12.13	3.270	.594	.490
S15	11.87	3.643	.496	.564
S16	11.35	3.960	.492	.575

3.6.2.5 Indicators Internal consistency among indicators of Interpersonal Skills

Case Processing Summary			
		N	%
Cases	Valid	60	100.0
	Excluded ^a	0	000.0
	Total	60	100.0

Reliability Statistics	
Cronbach's Alpha	N of Items
.731	3

Item-Total Statistics				
	If Item Is Removed, Scale Mean	Deleted Item Scale Variance	Item-total correlation that has been fixed	If an item is deleted, Cronbach's Alpha
S17	8.33	1.989	.294	.511
S18	8.48	1.847	.404	.330
S19	8.15	1.994	.336	.442

3.6.3 Work Engagement Scale

3.6.3.1 Internal Consistency among the Work Engagement Scale Indicators

Case Processing Summary			
		N	%
Cases	Valid	60	100.0
	Excluded ^a	0	.0
	Total	60	100.0

Reliability Statistics	
Cronbach's Alpha	N of Items
.770	9

Item-Total Statistics				
	If Item Is Removed, Scale Mean	Deleted Item Scale Variance	Item-total correlation that has been fixed	If an item is deleted, Cronbach's Alpha
V1	29.72	27.190	.064	.807
V2	29.12	22.410	.637	.721
V3	29.60	22.041	.534	.734
D1	29.12	22.342	.616	.723
D2	28.92	23.162	.568	.732
D3	28.82	23.813	.460	.747
A1	28.57	24.250	.383	.758
A2	29.38	23.800	.555	.736
A3	29.30	24.146	.360	.762

3.7 INSTRUMENT USED AND THE PROCESS OF DATA COLLECTION

The questionnaire that was used to gather the data is included in Appendix I of the report. Two main types of data are frequently collected by questionnaires. Students' names, contact information, e-mail addresses, names of the college or institution, age, semester, and other demographic data are collected in the opening inquiries. The retention of personal information was not as lengthy as it should have been to ensure an accurate answer from the respondent.

The survey's second set of questions examines respondents' usage of technology in relation to variables like student engagement, self-directed learning, and academic success. The statements and questions are rated on a 10-point frequency scale. Due to the information they include about the kind of construct they predict, all of these statements and questions are also known as indicators. The following three scales were used to frame these claims following a thorough examination of the literature: the Media and Technology Usage and Attitudes Scale (MTUAS), the Self-rating scale of self-directed learning (SRSSDL) Schaufeli et al., (2006)., and the Utrecht's work engagement scale UWES-S; Rosen, Whaling, et al., (2013) Students also provided

their grade point average (GPA), which was employed in the current study as a metric of academic performance, in addition to demographic data.

The MTUAS scale was created to evaluate media and technology usage habits and attitudes. It comprises 60 overall components and 15 subscales. Because the subscales of the scale are both internally and externally legitimate, the designers of the scale stated that they "may be used individually or jointly" Rosen, Whaling, et al., (2013).

The MTUAS attitude scale was not used since it would have made the questionnaire longer and would have required more time to complete. The MTUAS subscales for texting, using a smartphone, sharing media, searching the internet, playing video games, and general social media activity were used in the current study. With 18 total items and ten-point Likert-type response scales, the questionnaire was created using these seven subscales. Confirmatory factor analysis was used to assess the Turkish adaptation of the MTUAS scale, and the results showed good or perfect match indices. Sabbah et al., (2019). The MTUAS scale's internal reliability coefficient, calculated using Cronbach's alpha, was 0.84. Williamson developed the SRSSDL (Self-rating scale of self-directed learning) in 2007 to rate self-directed learning. Awareness, learning techniques, learning activities, evaluation, and interpersonal skills are its five component parts. The questionnaire contained a total of 19 items from the aforementioned domains. Five points on a Likert scale were used to rate the response. The total reliability of SRSSDL was 0.97. The level of student engagement was measured using the Utrecht work engagement scale (UWES-S; Schaufeli et al., 2006). The scale consists of nine items that assess vigour, absorption, and devotion on a seven-point Likert-style response scale. In the dataset, the UWES's dependability was 0.91.

Table 3.3: List of items of the constructs

Variable	Measurement Item and Coding	References
E-mailing	<ol style="list-style-type: none"> 1. How often do you check your personal e-mail using any device (mobile phone, laptop, desktop, etc.?) 2. How often do you check your work or school email? 3. How often do you send receive or read email using any device (mobile, laptop, desktop, etc.?) 	Adapted from (Rosen, Whaling, et al., 2013)
Text Messaging	<ol style="list-style-type: none"> 1. How often do you send and receive text messages on a mobile phone? 2. How often do you check for text messages on a mobile phone? 3. How often do you use your mobile phone during class or work time? 	
Smartphone Usage	<ol style="list-style-type: none"> 1. How often do you read e-mail on a mobile phone? 2. How often do you browse the web on a mobile phone? 	
Media Sharing	<ol style="list-style-type: none"> 1. How often do you watch video clips on a computer? 2. How often do you download media files from other people on a computer? 	
Internet searching	<ol style="list-style-type: none"> 1. How often do you search the Internet for news on any device? 2. How often do you search the Internet for information on any device? 3. How often do you search the Internet for videos on any device? 	
Awareness	<ol style="list-style-type: none"> 1. Are you able to select best method for your own learning? 2. Are you able to identify your own learning needs? 	

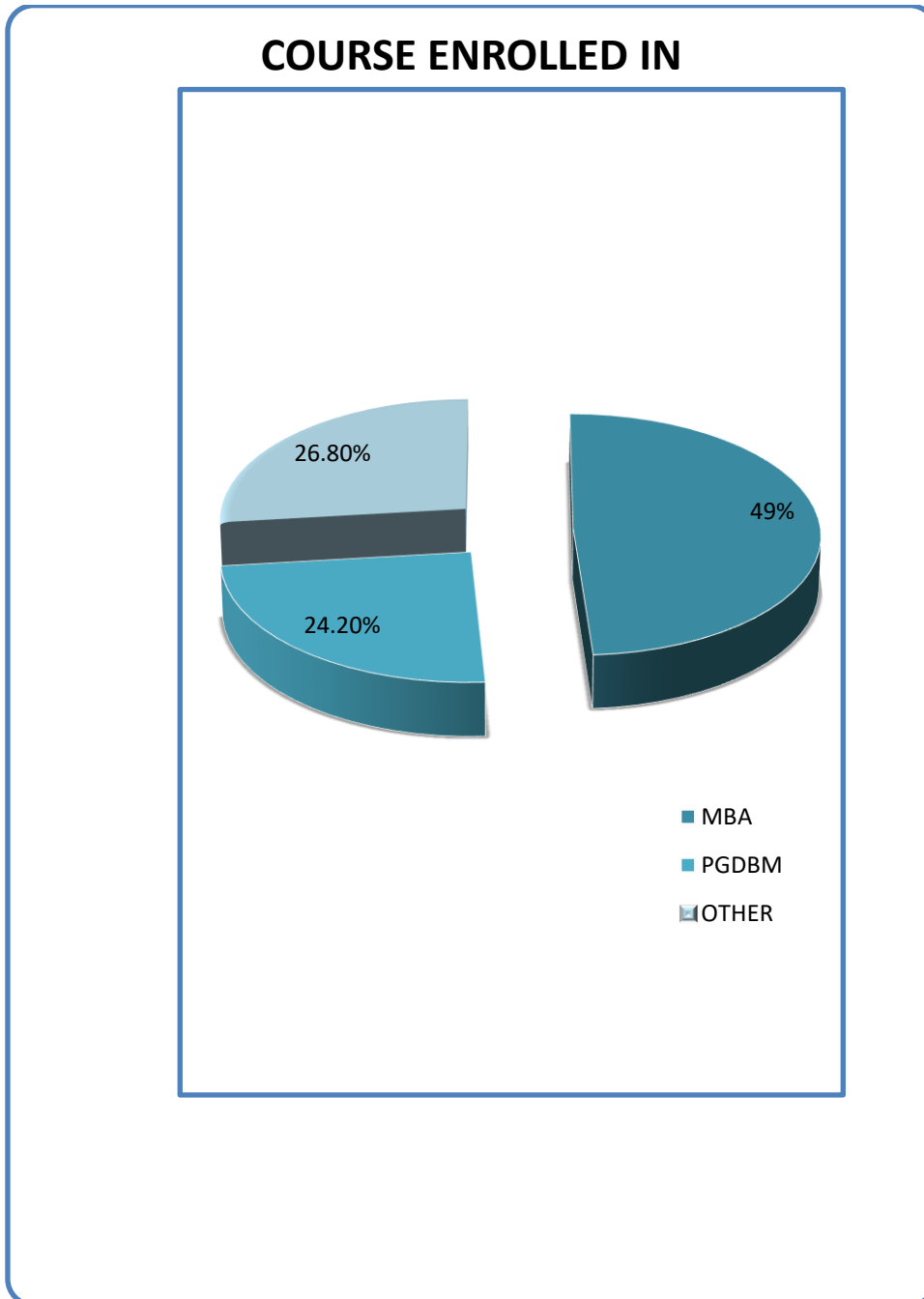
	<ol style="list-style-type: none"> 3. Are you up to date on different available learning resources? 4. You always take responsibility for your own learning 5. Rather than providing information only you consider teachers as facilitators. 	<p>Adapted from (Lucia Cadarin.,2013)</p>
Learning Strategies	<ol style="list-style-type: none"> 1. Do you think inter-active teaching- learning sessions are more effective than just listening to lectures? 2. Do you find learning from case studies useful? 3. Do you think that modern educational interactive technology enhances your learning process? 4. Do you think "Role Play" is a useful method for complex learning? 	
Learning Activities	<ol style="list-style-type: none"> 1. Are you able to identify the important points when reading a chapter or an article? 2. Are you able to use information technology effectively? 3. Do you enjoy exploring information beyond the prescribed course objectives? 	
Evaluation	<ol style="list-style-type: none"> 1. Are you able to monitor your own learning progress? 2. Are you able to identify your areas of strength and weakness? 3. Do success and failure both inspire you to further learning? 4. Are you able to identify the areas for further development in whatever you have accomplished? 	
Interpersonal Skills	<ol style="list-style-type: none"> 1. Are you able to identify your role within a group? 2. Do you make use of any opportunities that come across? 	

	3. Are you able to maintain good interpersonal relationship with others?	
Work Engagement Scale	<ol style="list-style-type: none"> 1. When you are doing your work as a student you feel bursting with energy. 2. You feel energetic and capable when you are studying or going to class. 3. You are enthusiastic about your studies. 4. Your studies inspire you. 5. You feel like going to class when you get up in the morning. 6. When you study intensely you feel happy. 7. You are proud of your studies. 8. You are immersed in your studies. 9. When you are studying you get carried away. 	Adapted from (Macros A.Carmona-Halty.,2019)

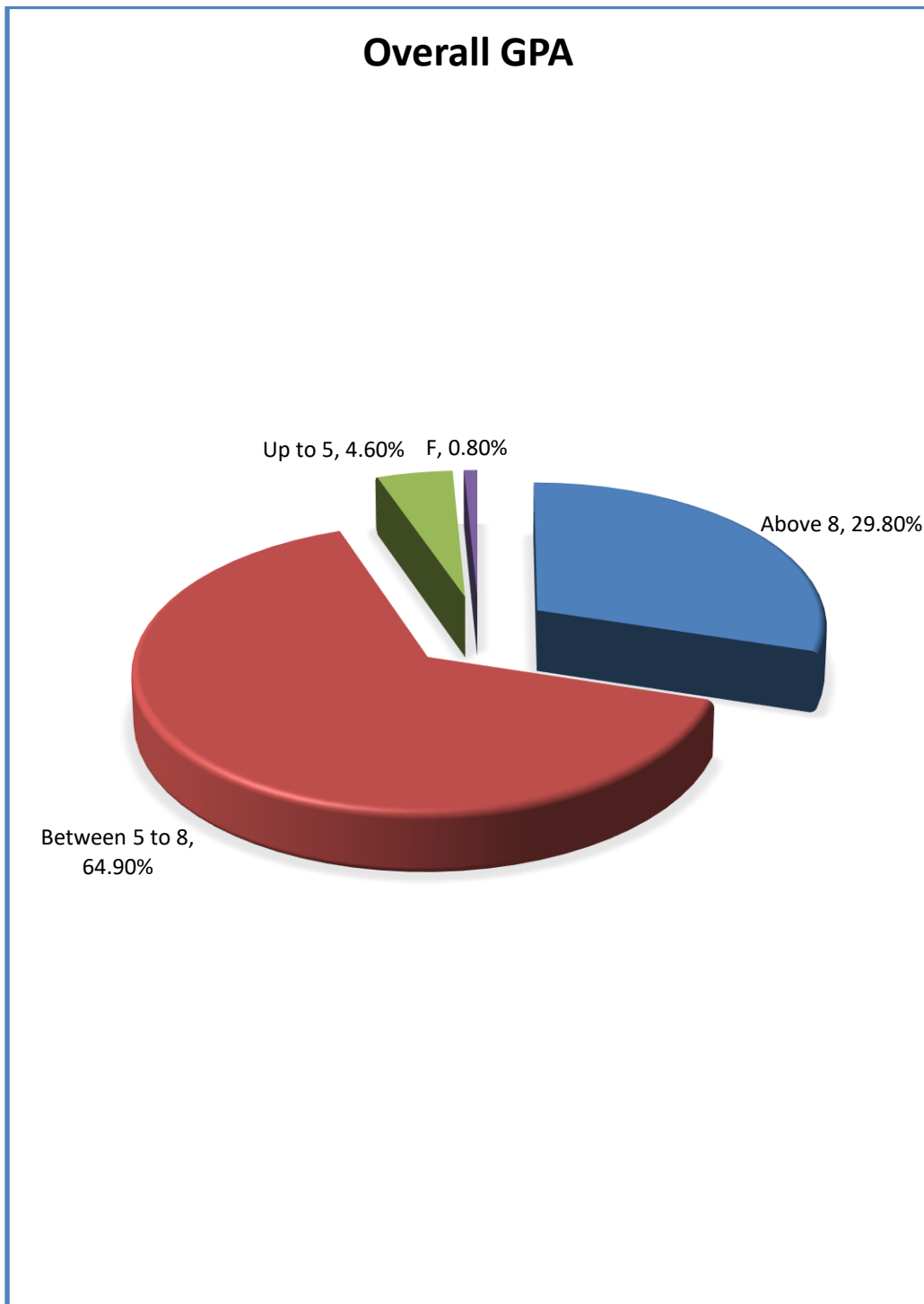
Source: Literature Review

3.8 Data Responses:

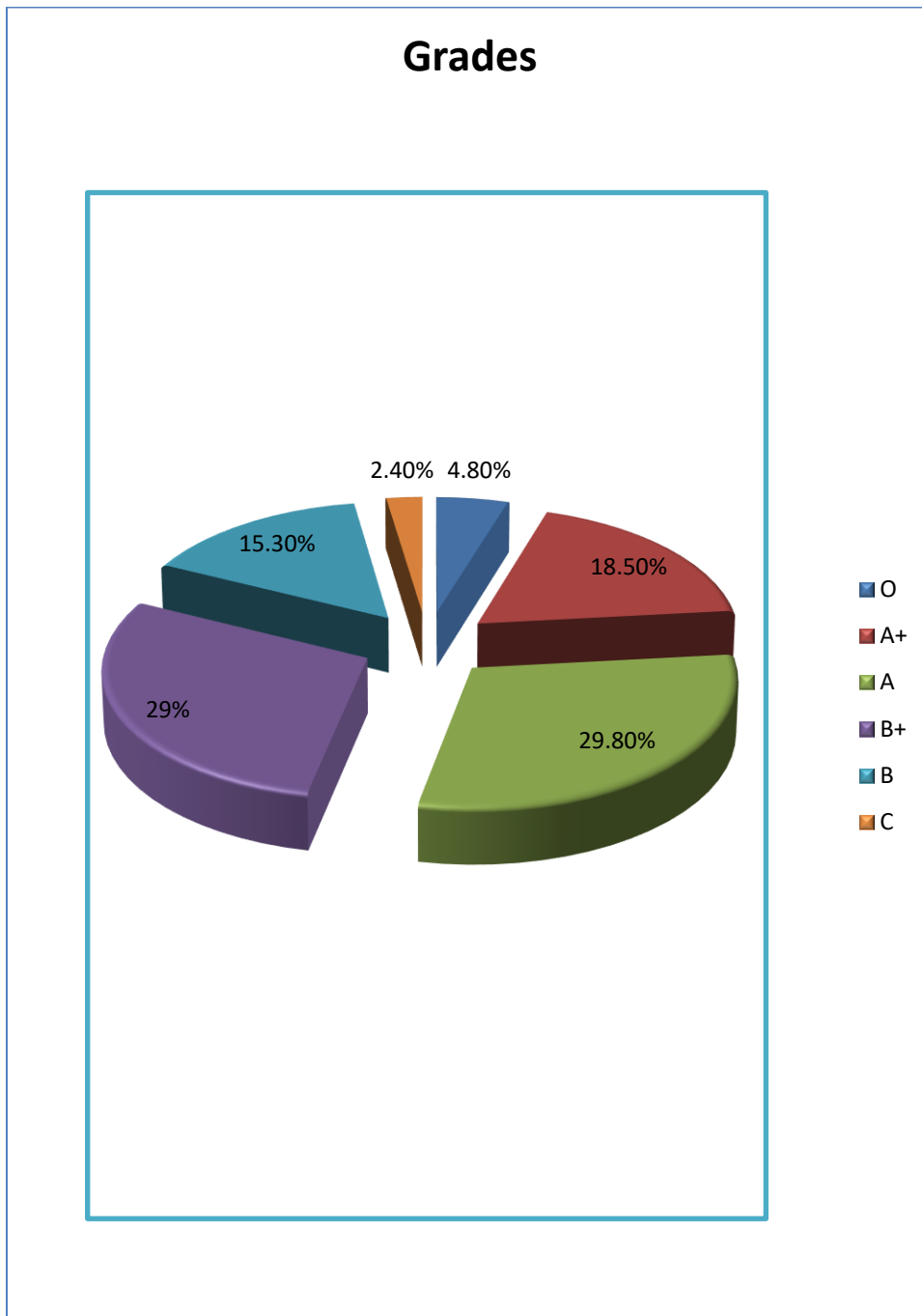
1. Course you are enrolled in?



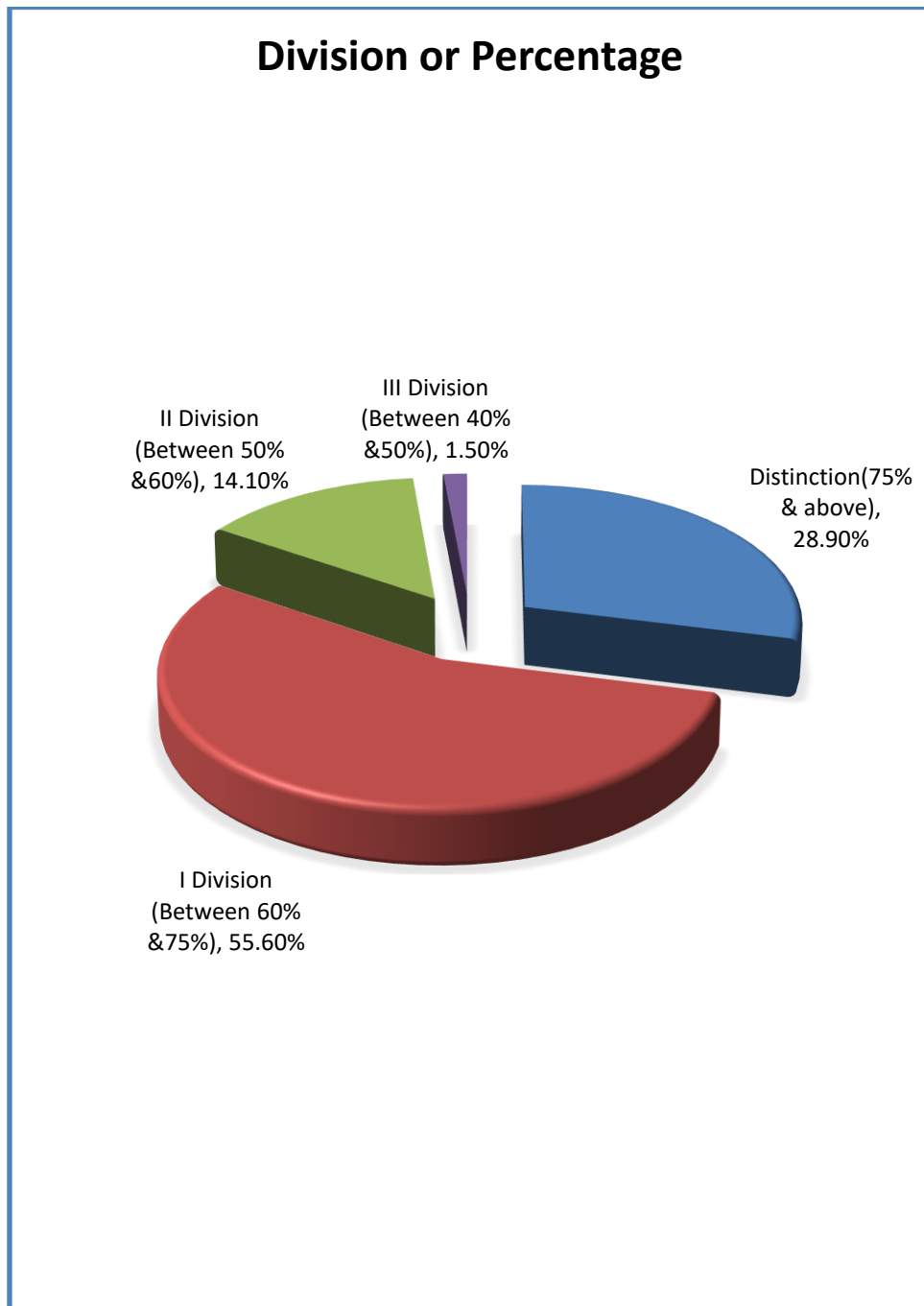
2. Your Overall GPA?



3. Your grade in the previous semester?

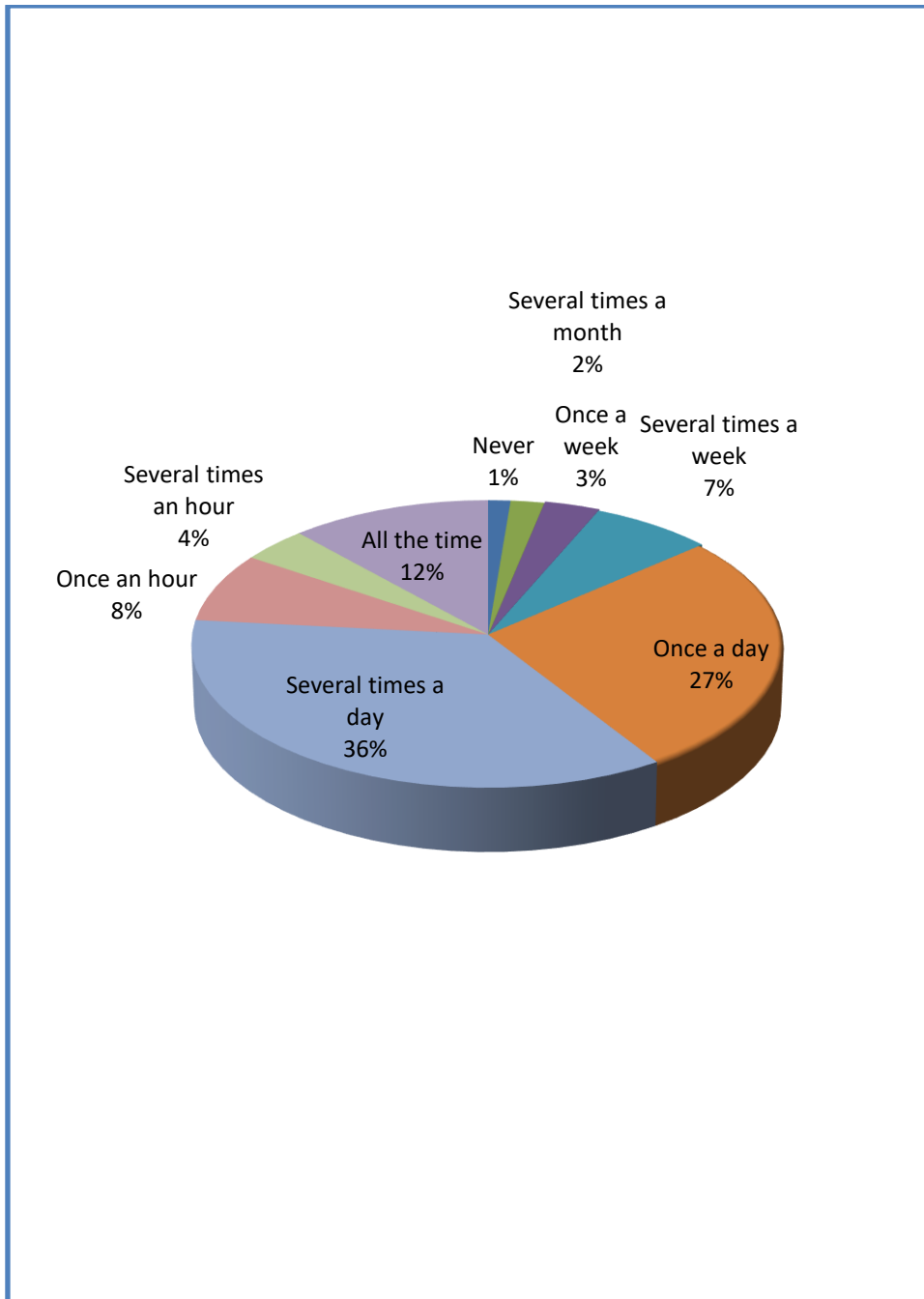


4. Your Division or percentage?

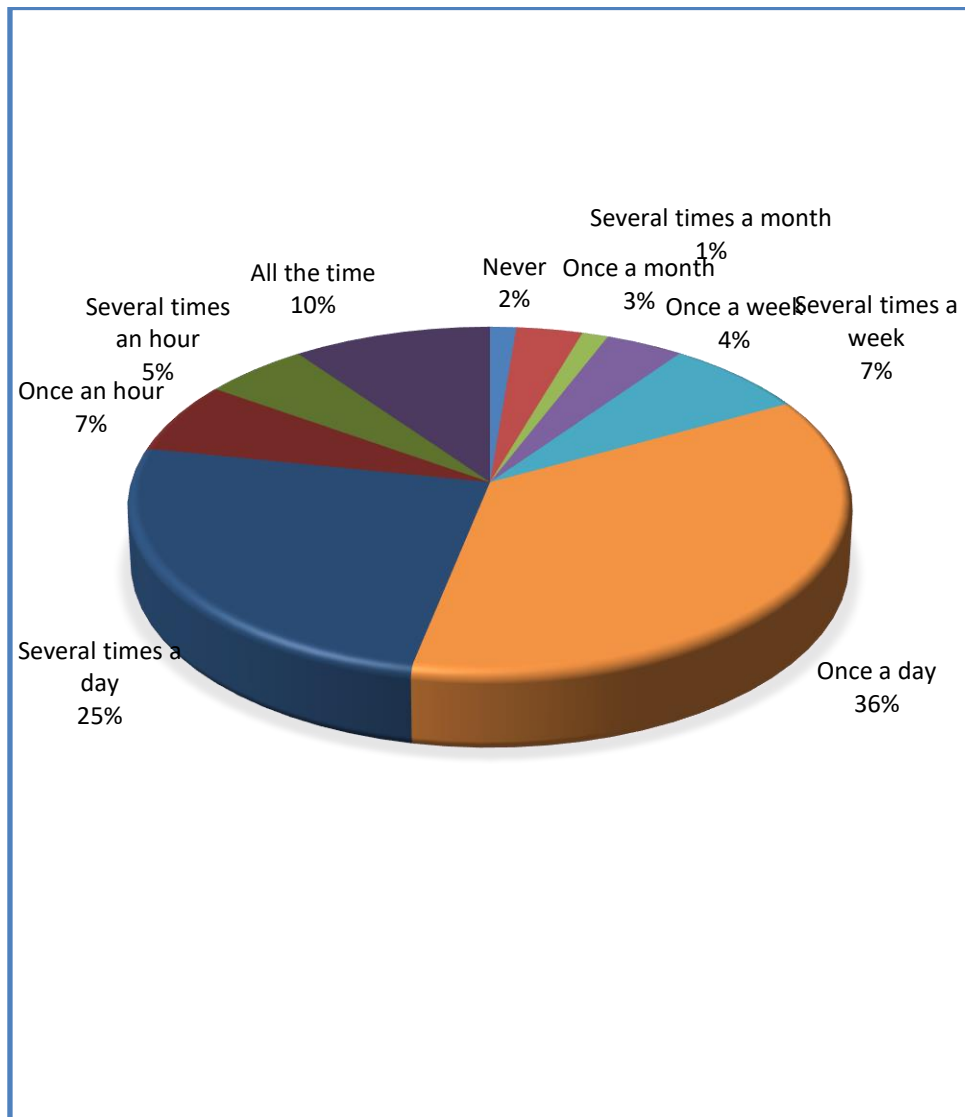


3.8.1 MTUAS Scale

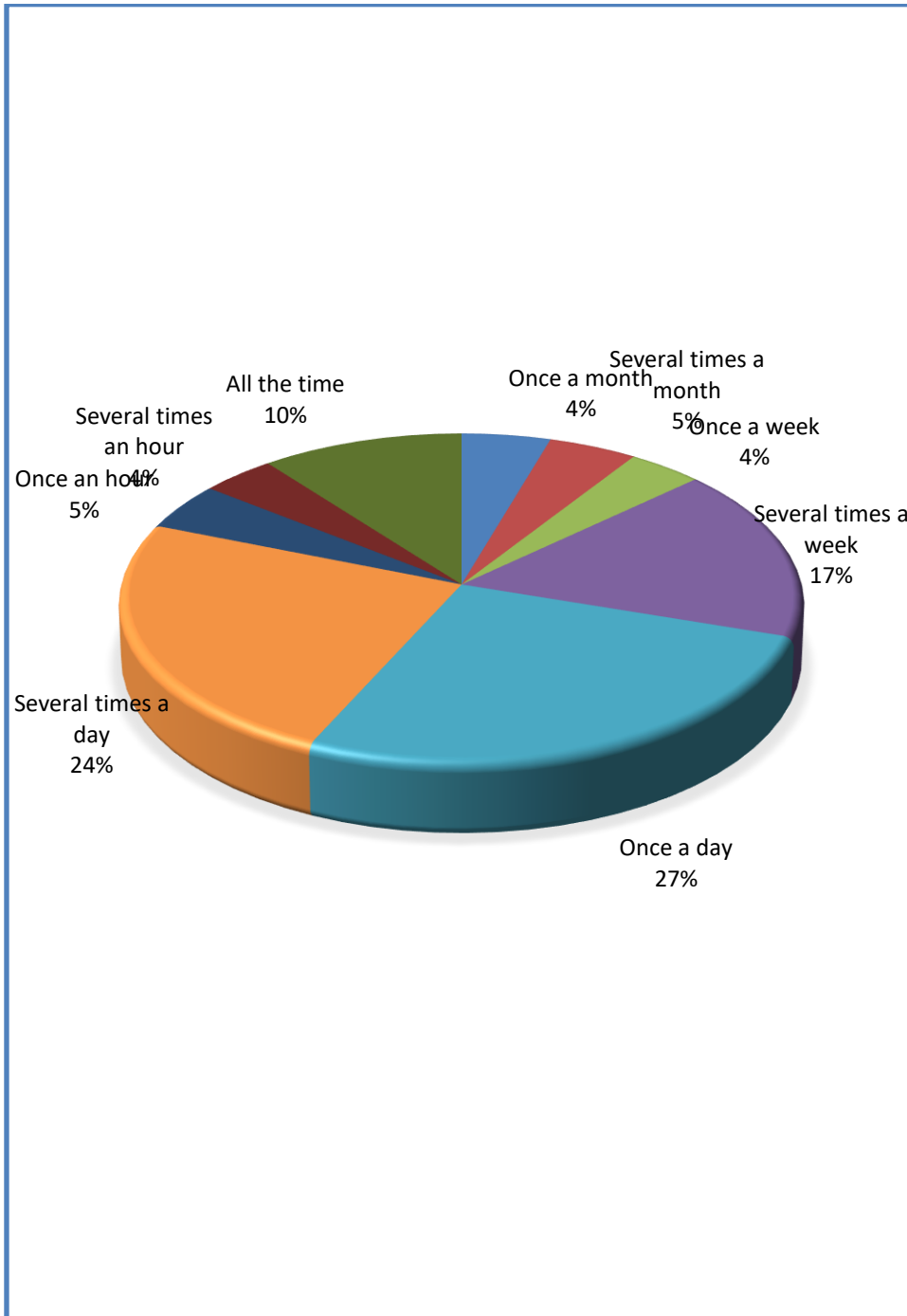
1. How often do you check your personal e-mail using any device (mobile phone, laptop, desktop, etc?)



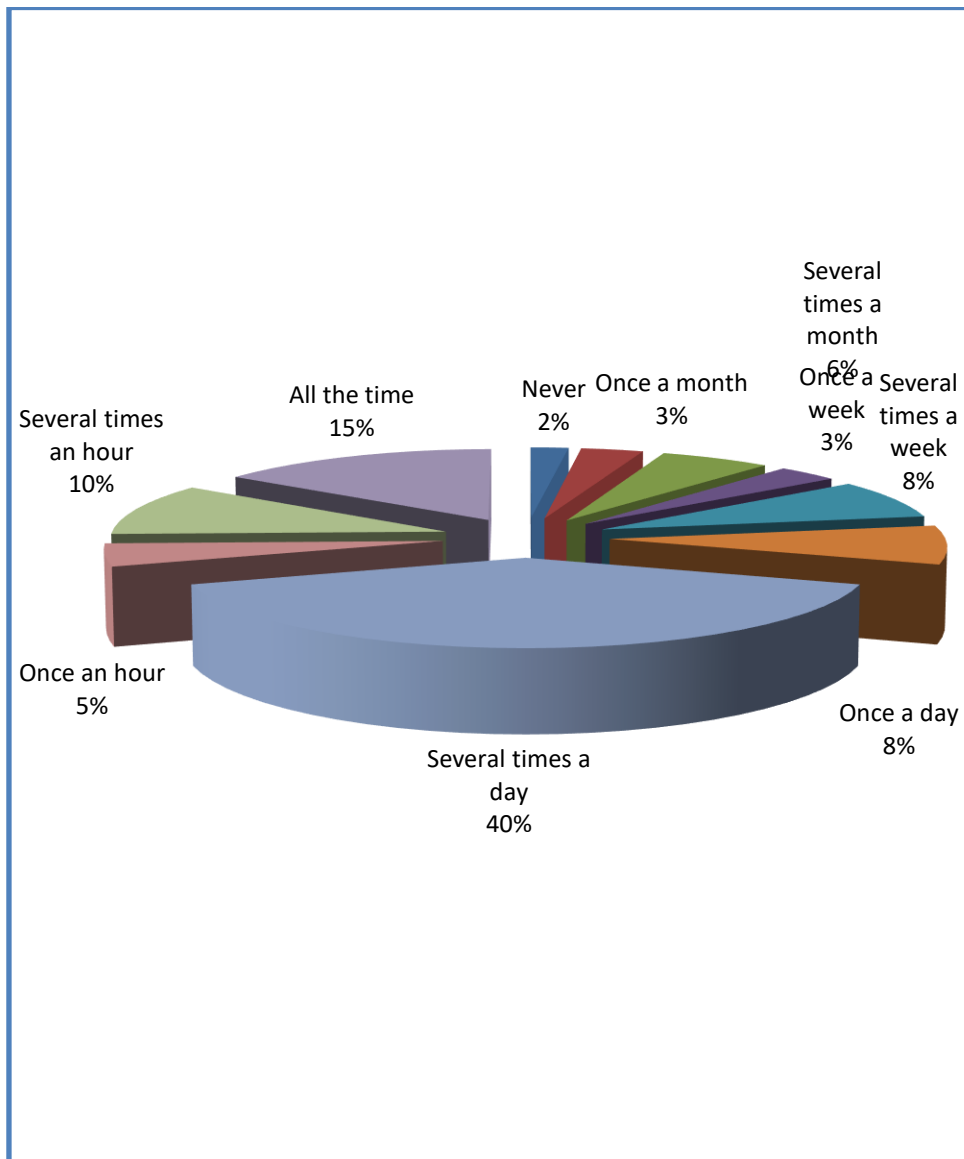
2. How often do you check your work or school email?



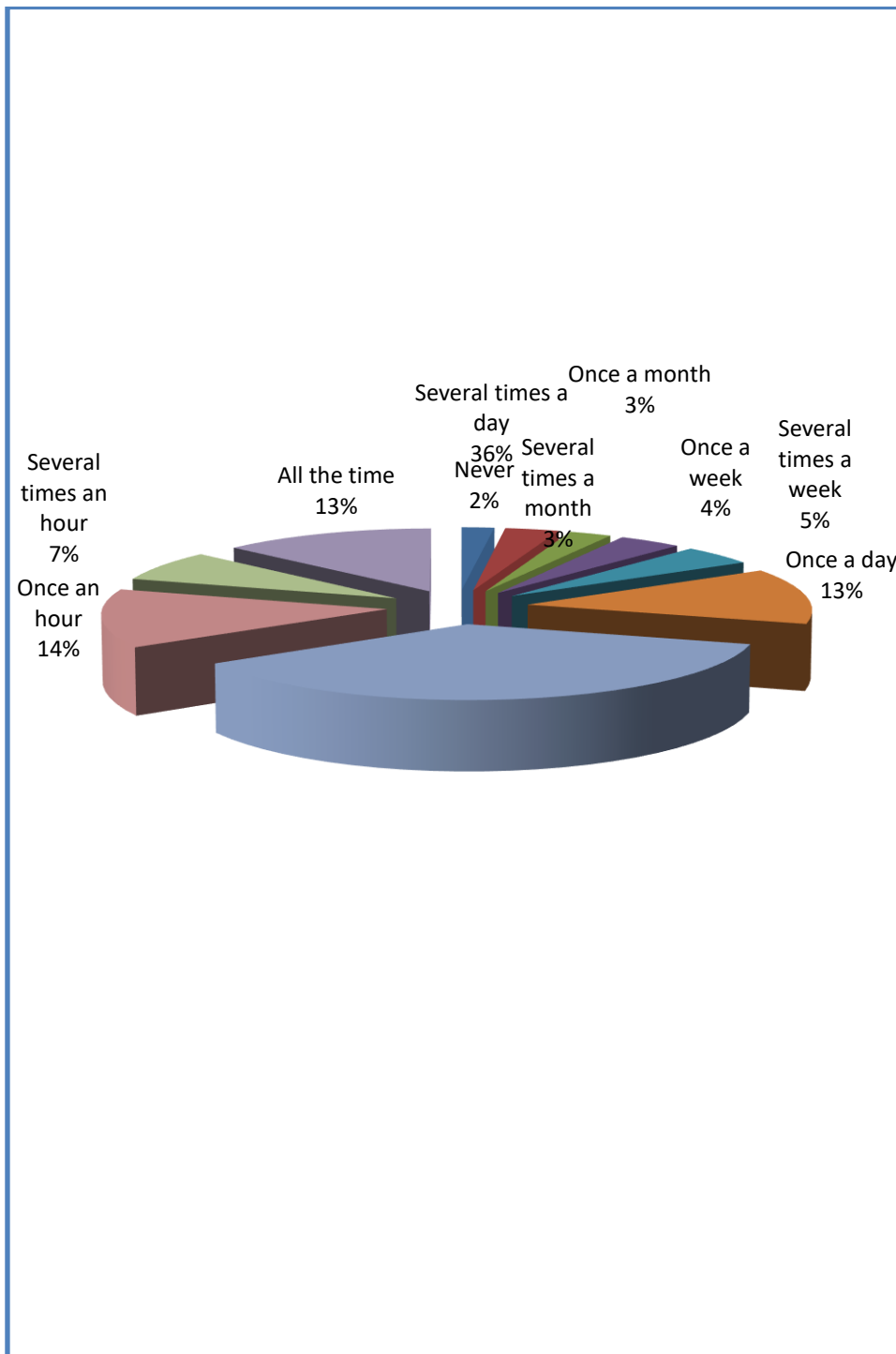
3. How often do you send receive or read email using any device (mobile, laptop, desktop, etc.?)



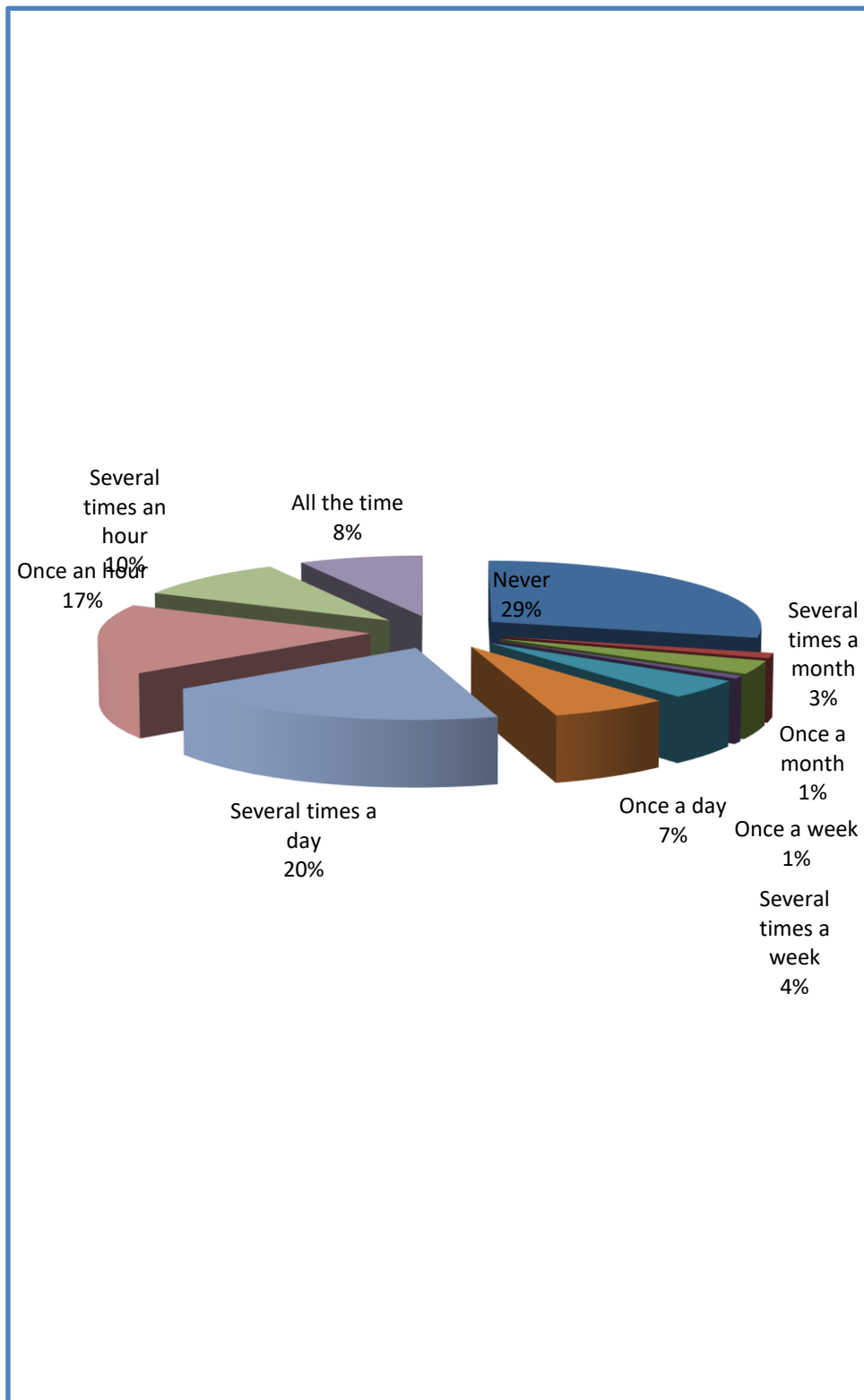
4. How often do you send and receive text messages on a mobile phone?



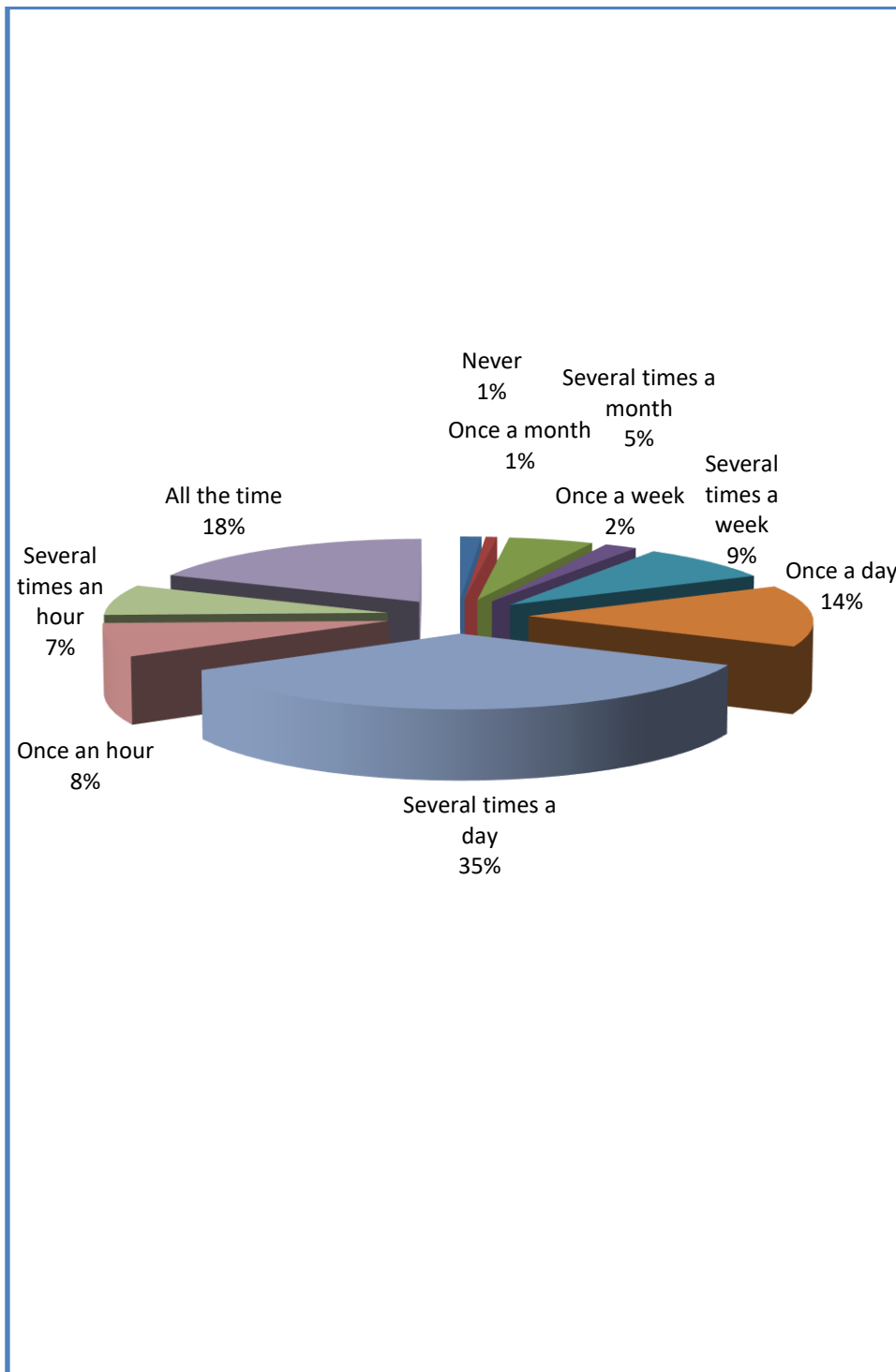
5. How often do you check for text messages on a mobile phone?



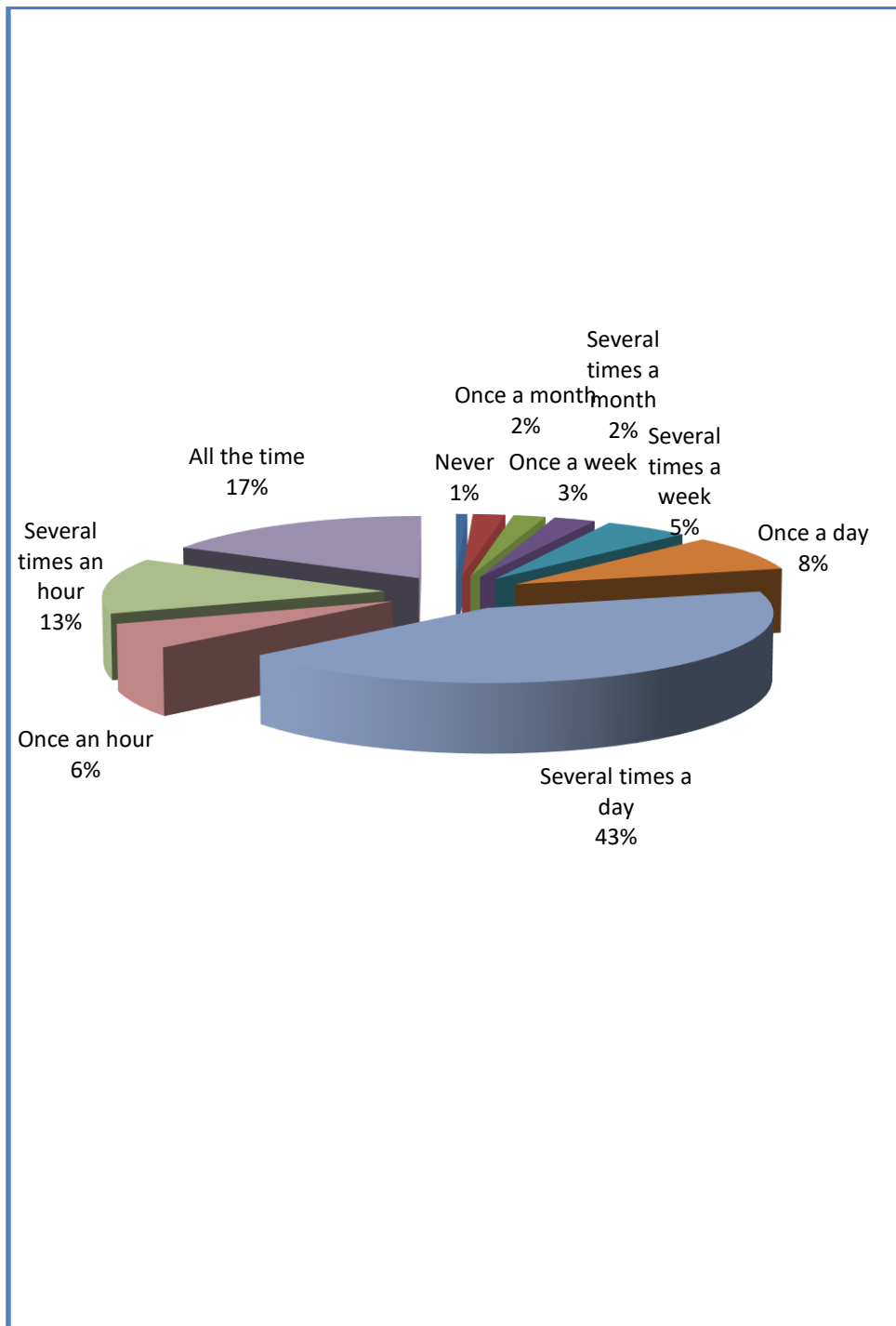
6. How often do you use your mobile phone during class or work time?



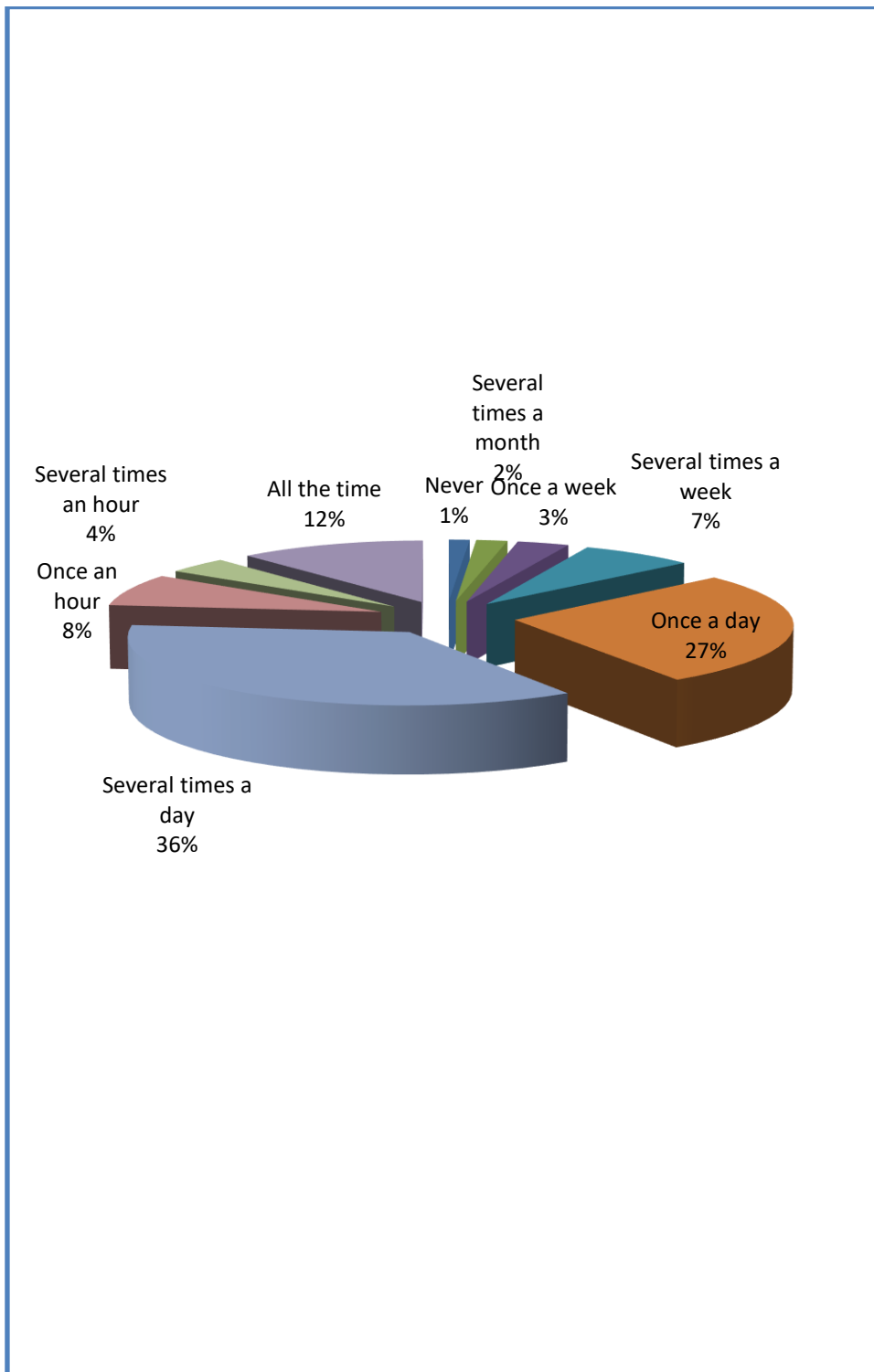
7. How often do you read an email on a mobile phone?



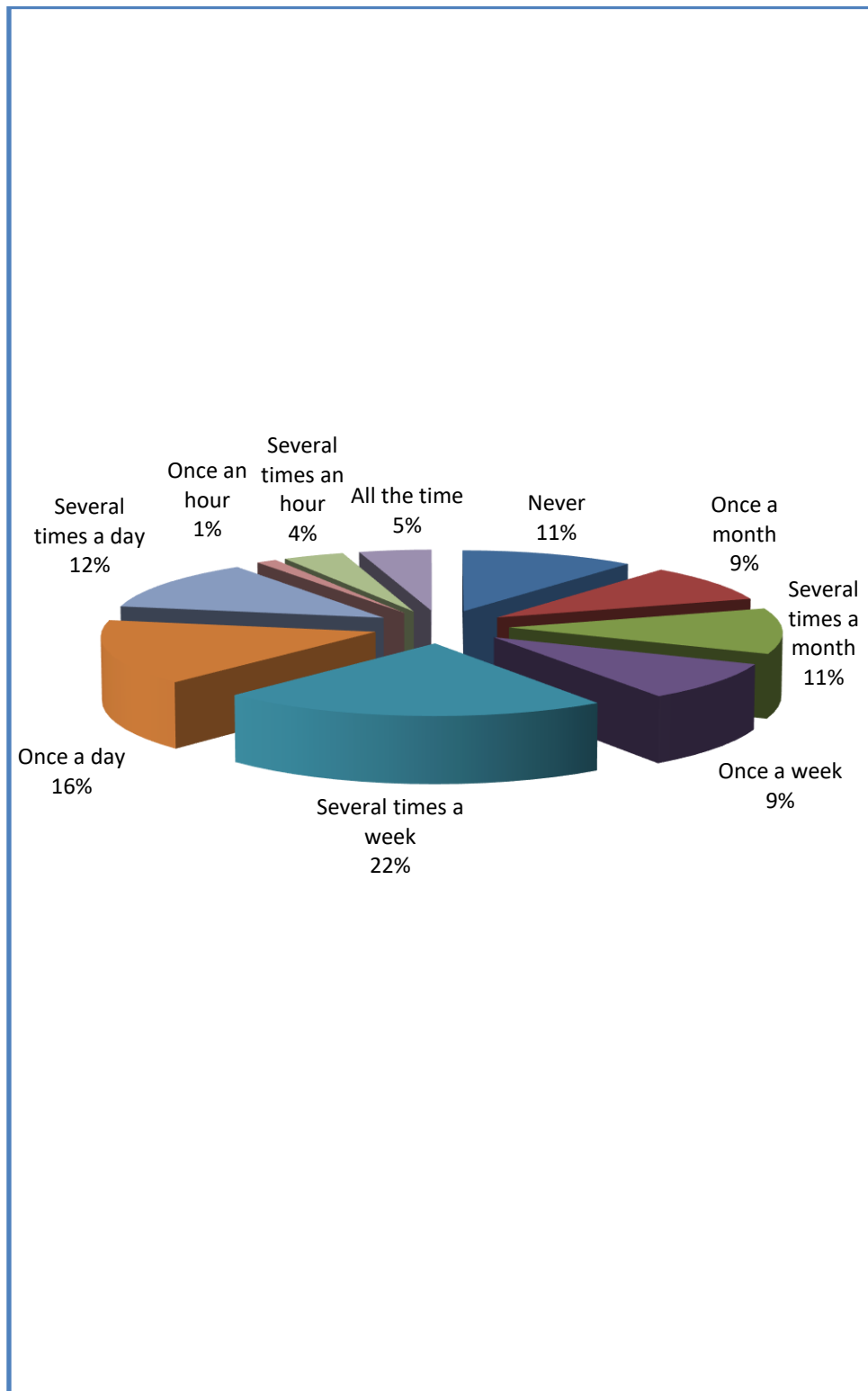
8. How often do you browse the web on a mobile phone?



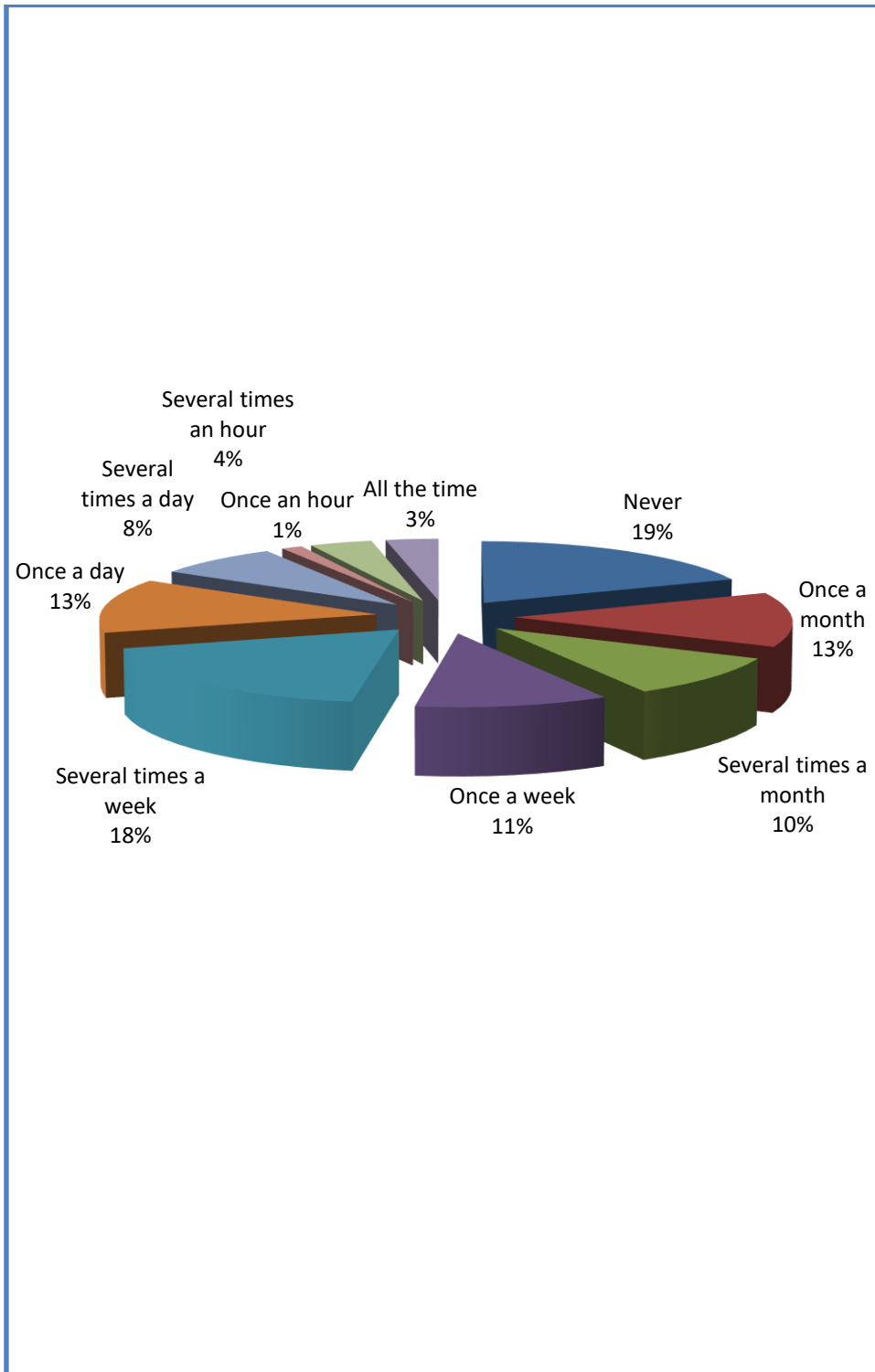
9. How often do you search for information on a mobile phone?



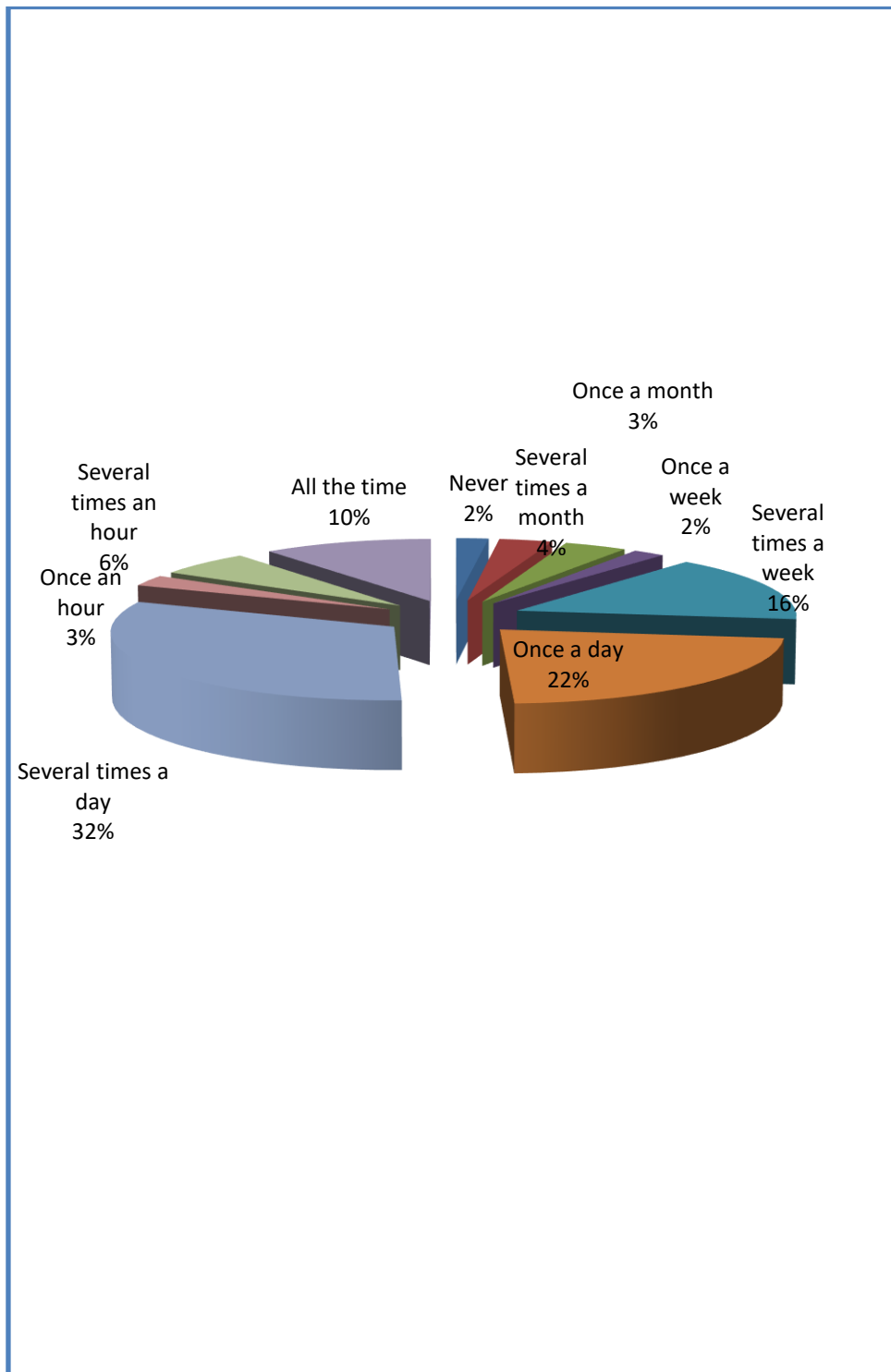
10. How often do you watch video clips on a computer?



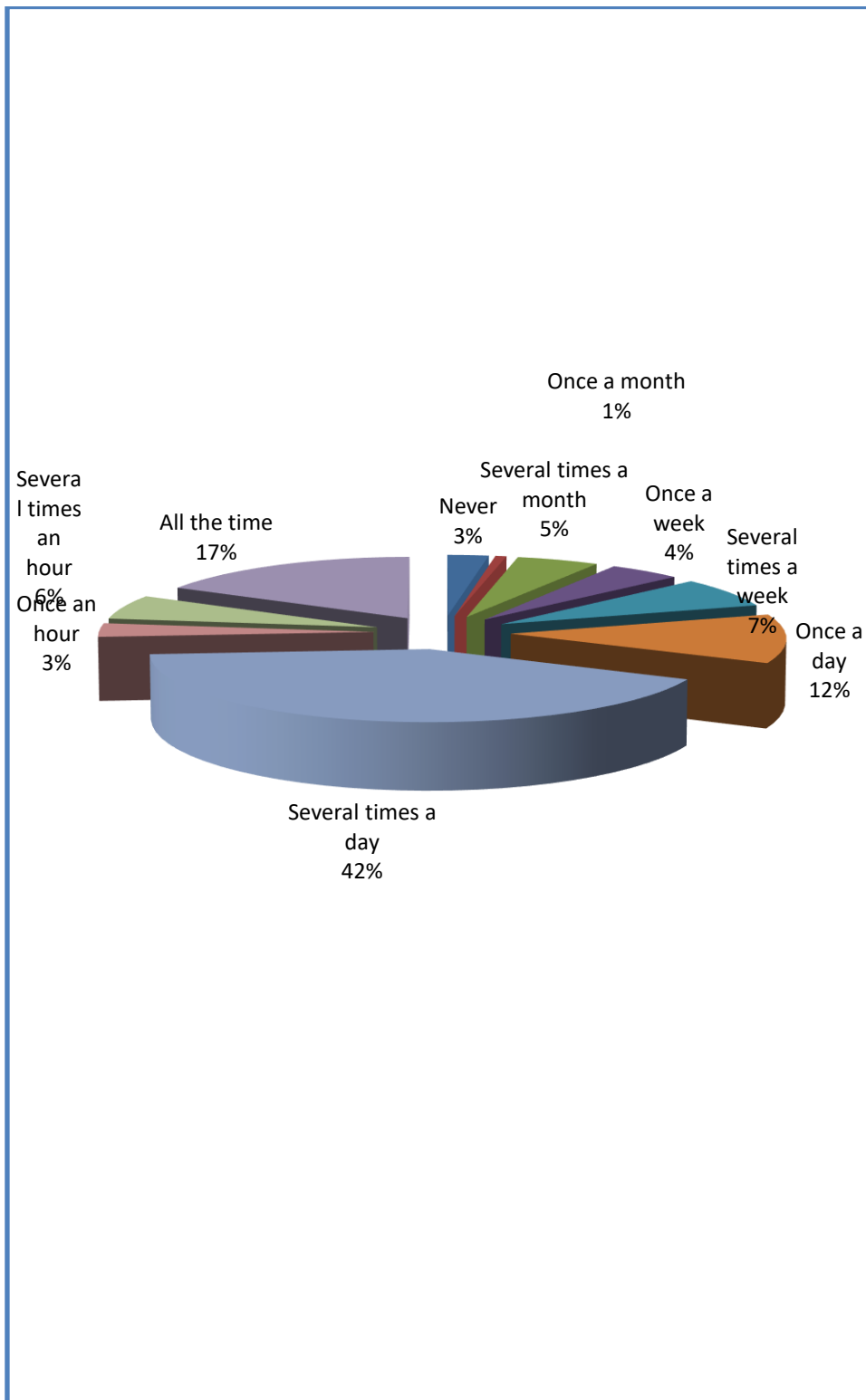
11. How often do you watch TV shows, Movies, etc. on a computer?



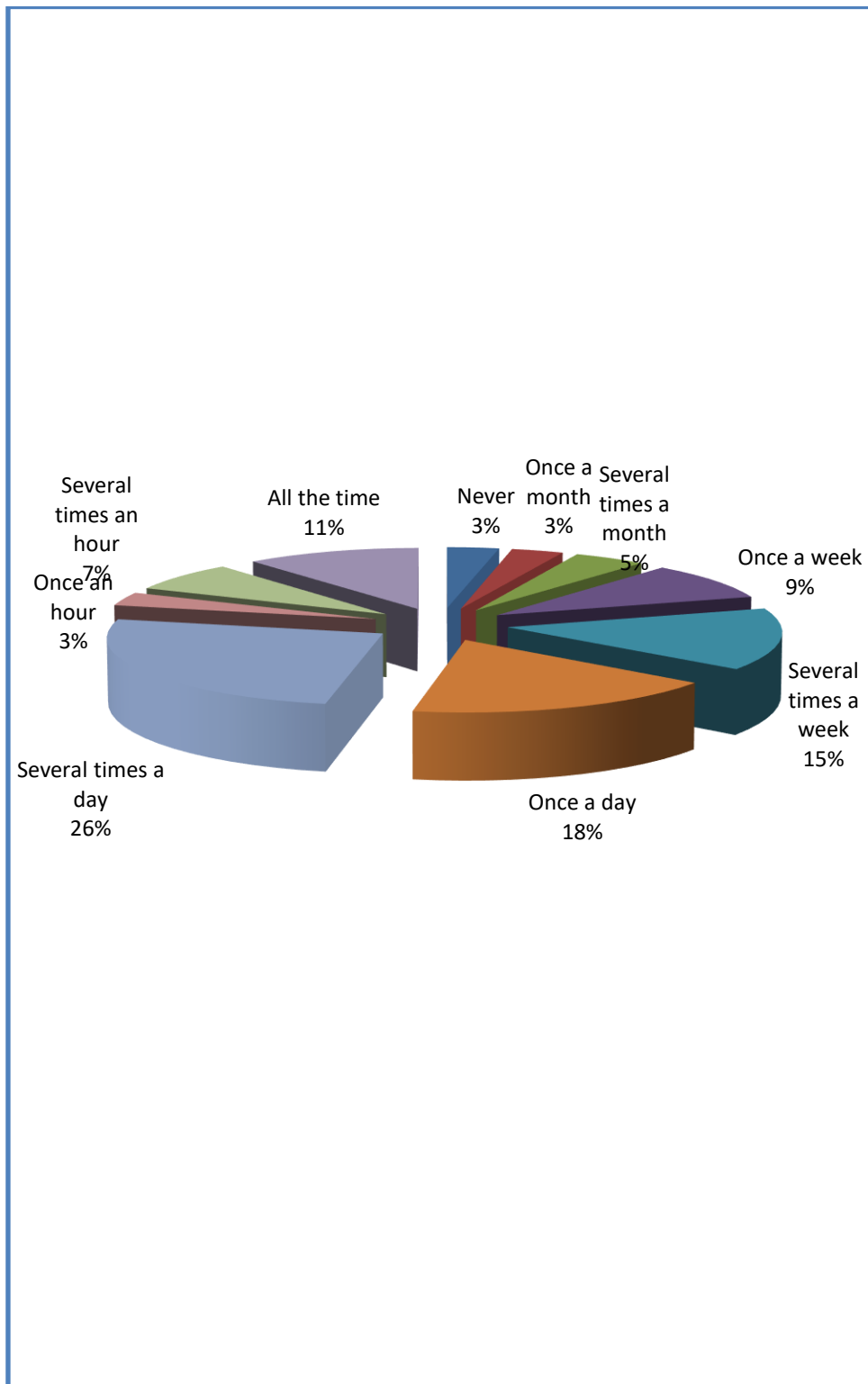
12. How often do you search the Internet for news on any device?



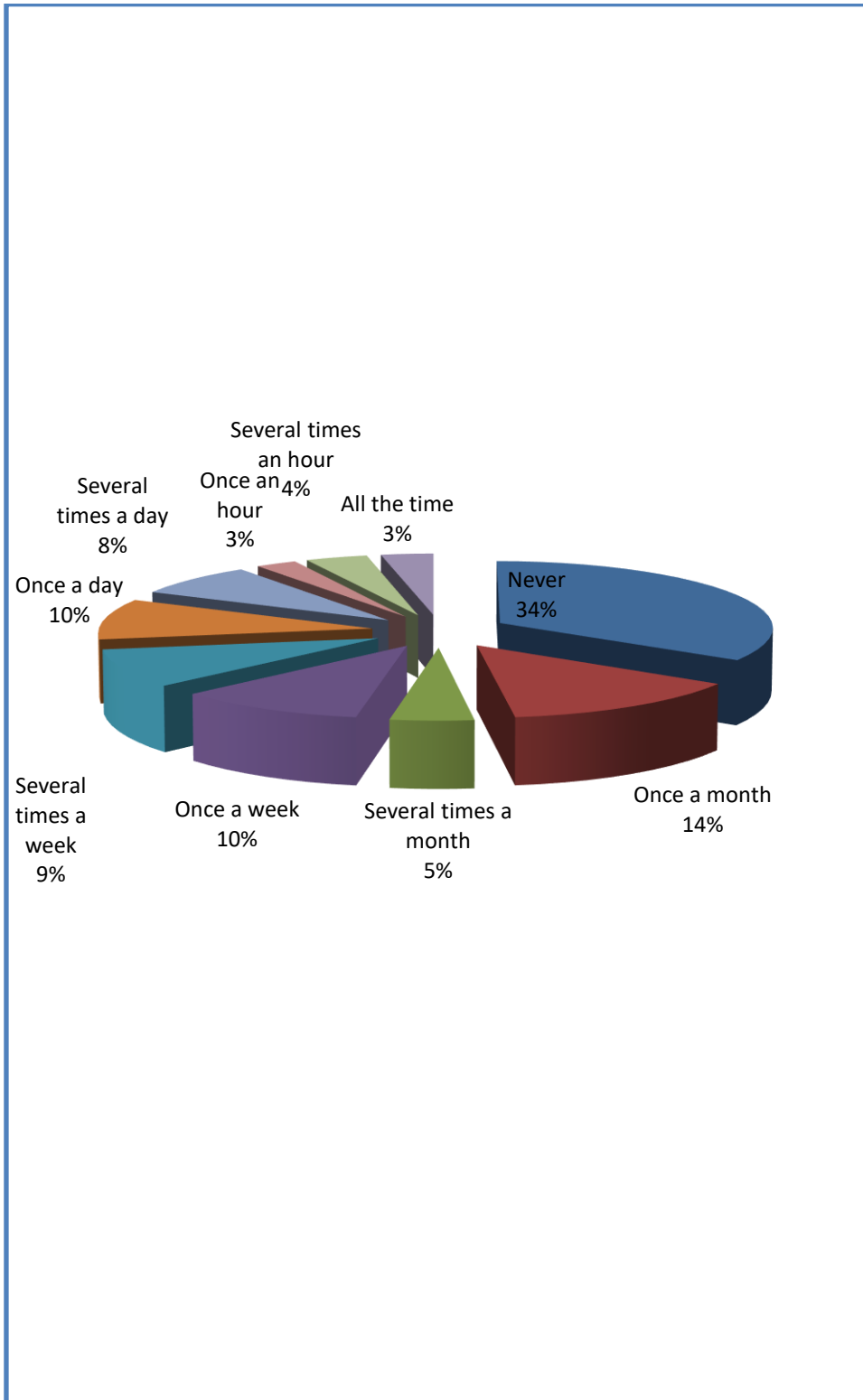
13. How often do you search the Internet for information on any device?



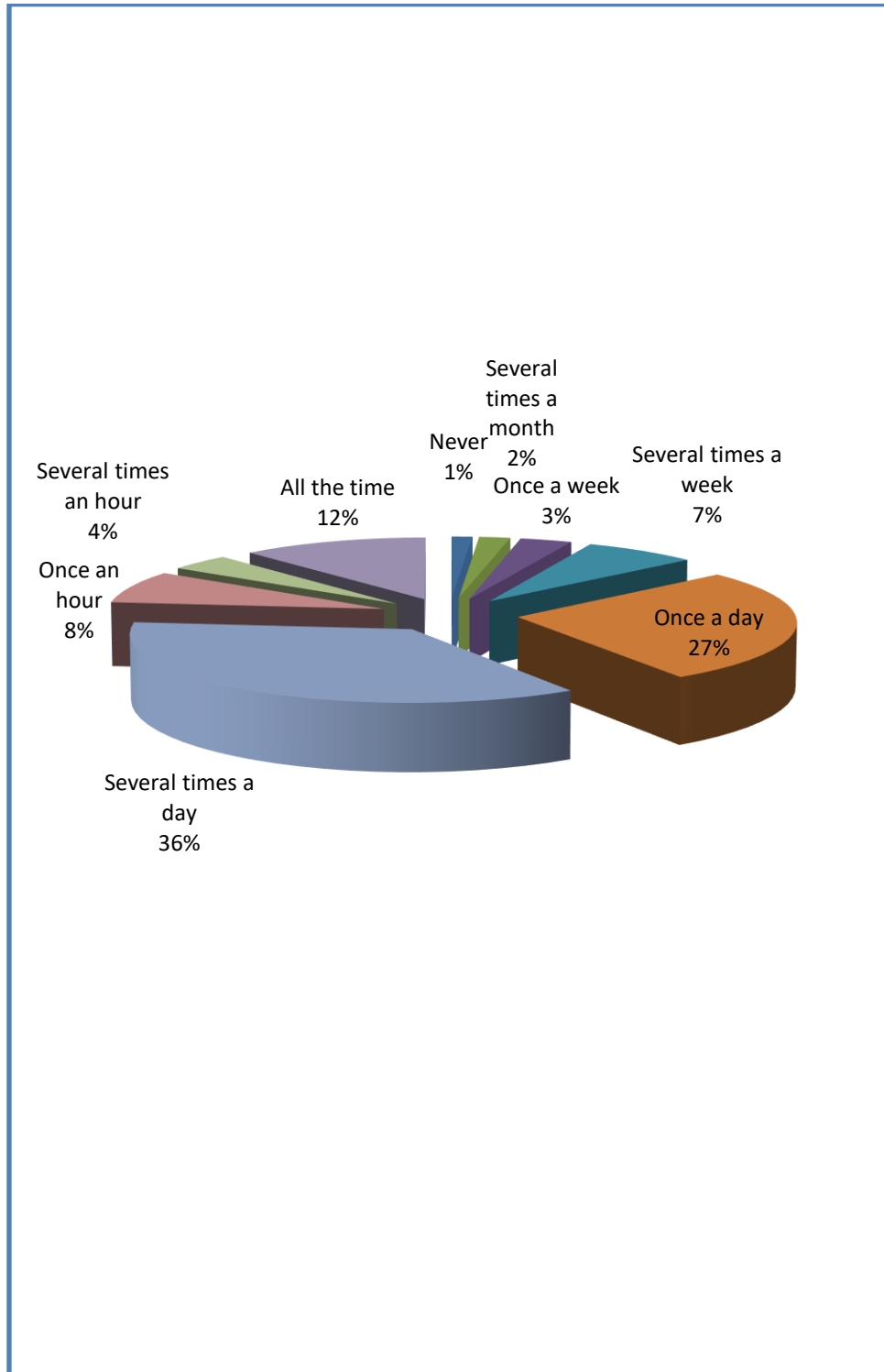
14. How often do you search the Internet for videos on any device?



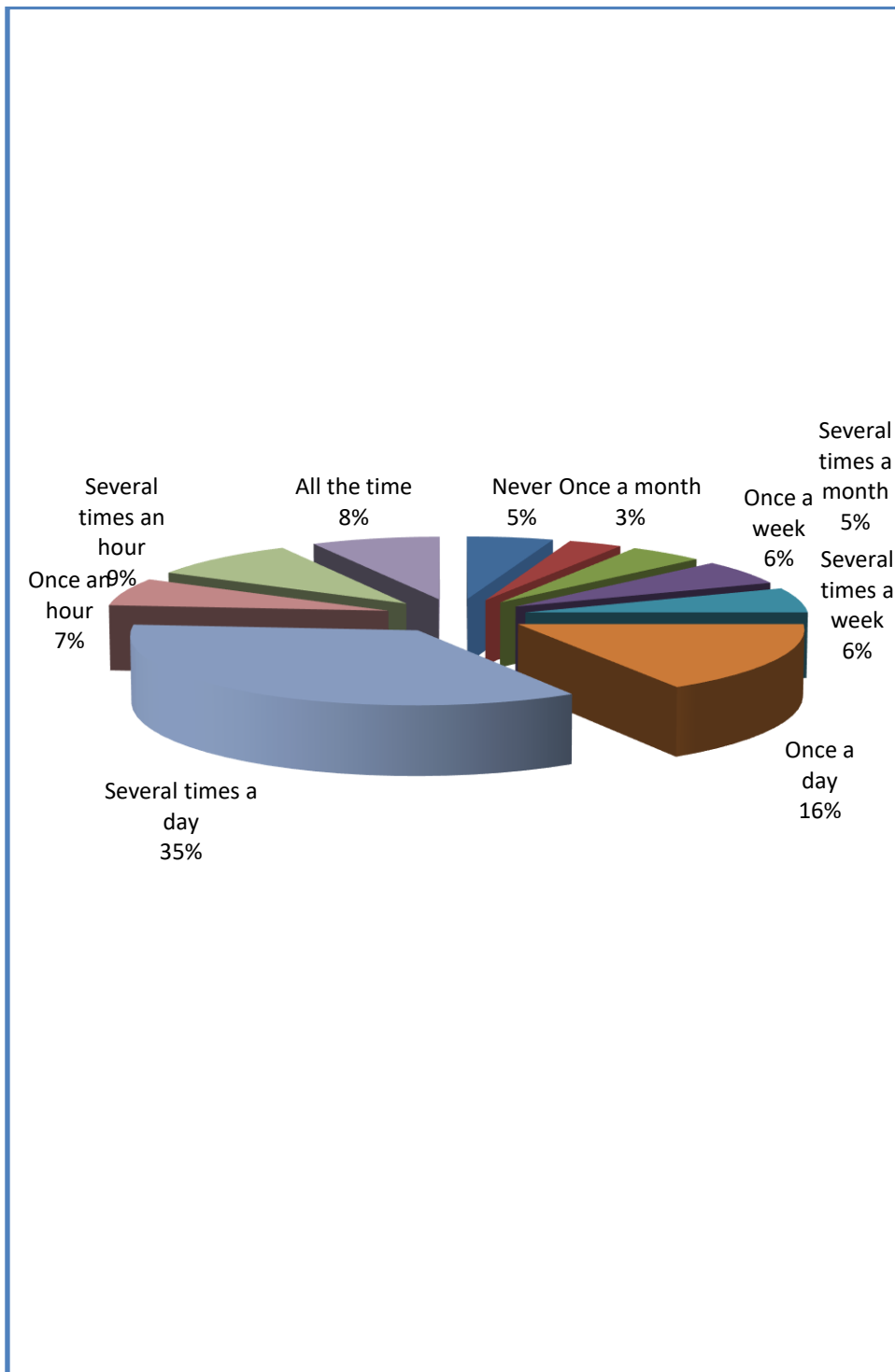
15. How often do you play games on a computer or smartphone BY YOURSELF?



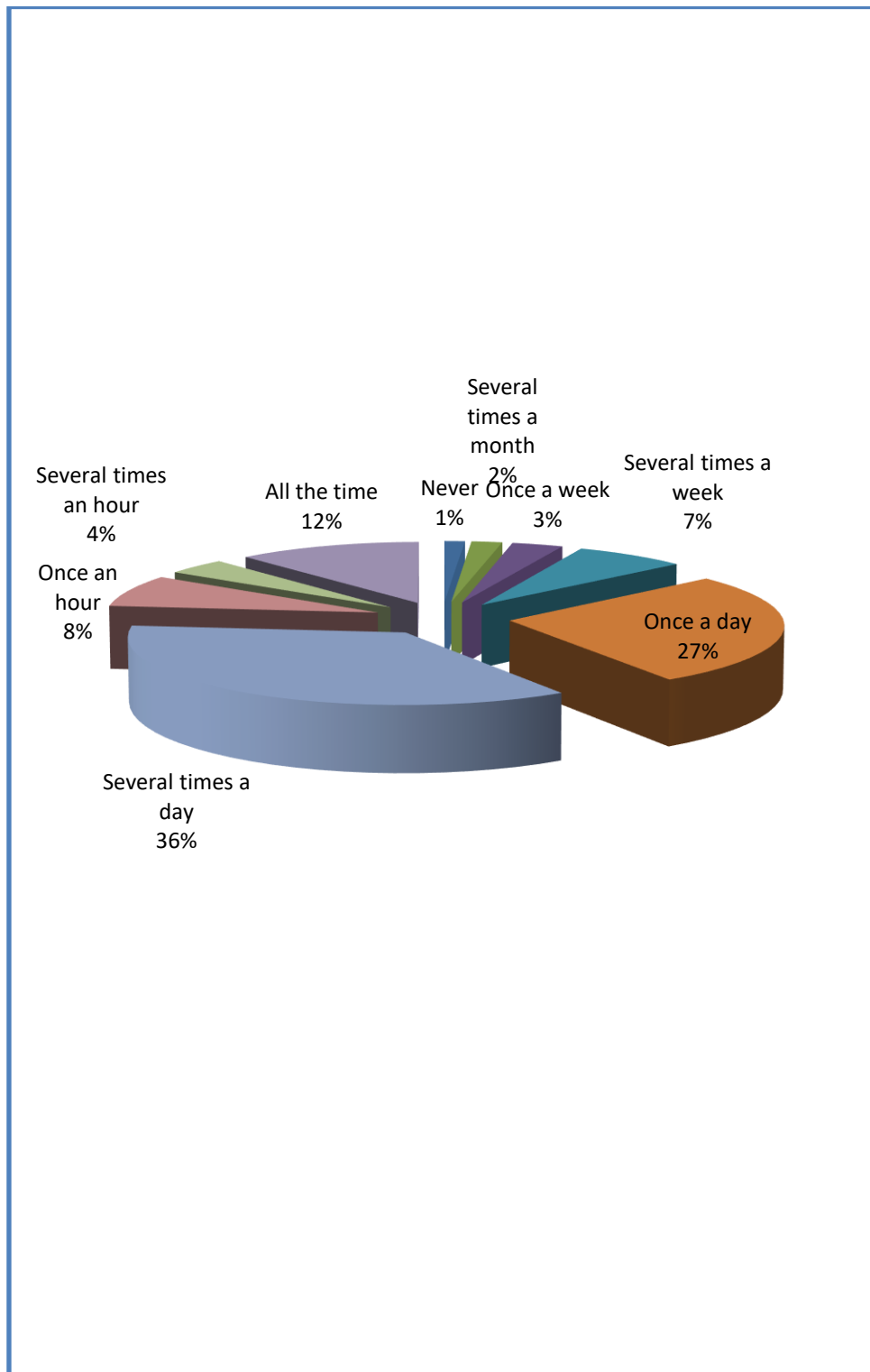
16. How often do you play games on a computer or smartphone WITH OTHER PEOPLE ONLINE?



17. How often do you check your Facebook page or other social networks?

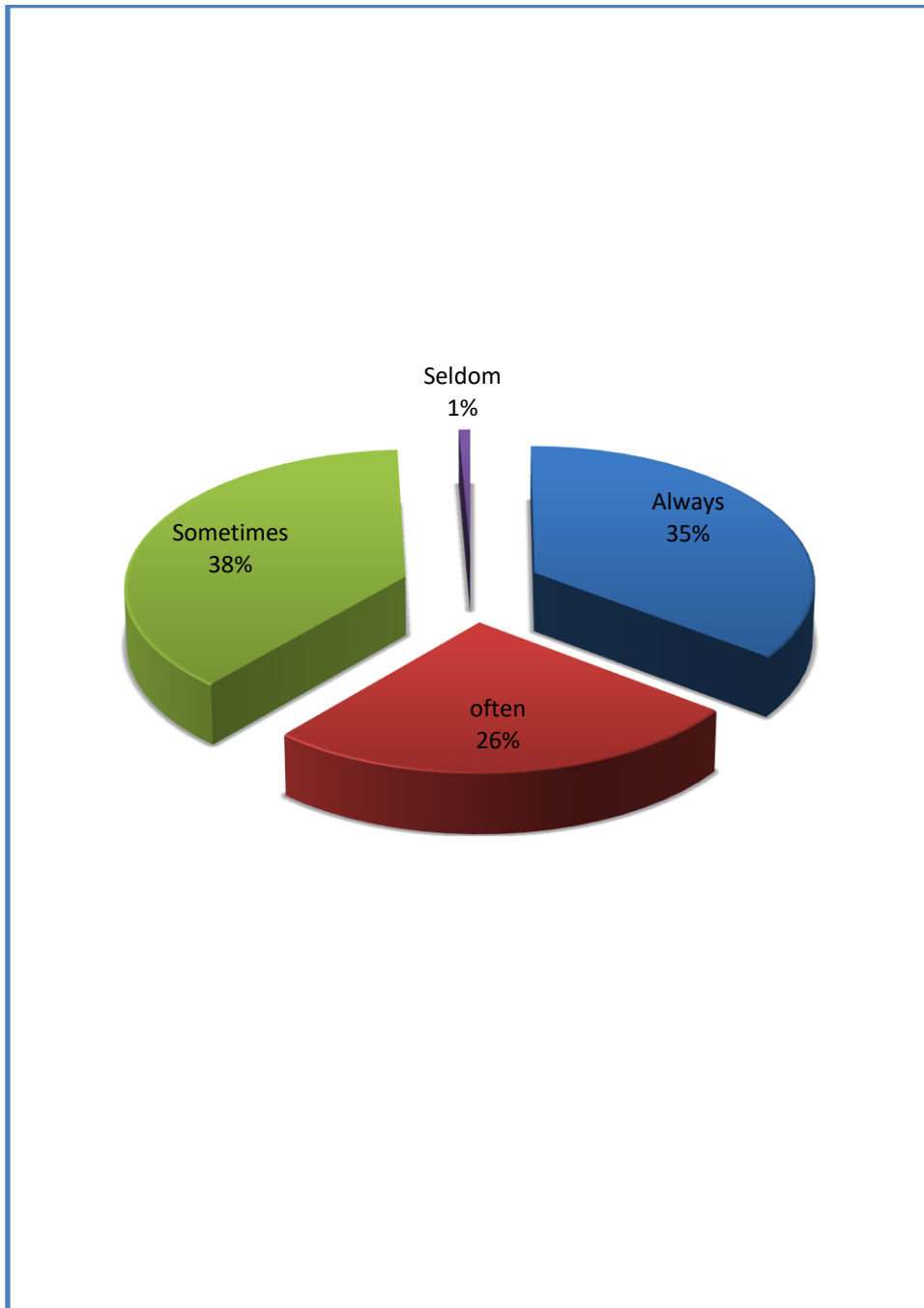


18. How often do you check your Facebook page from your smartphone?

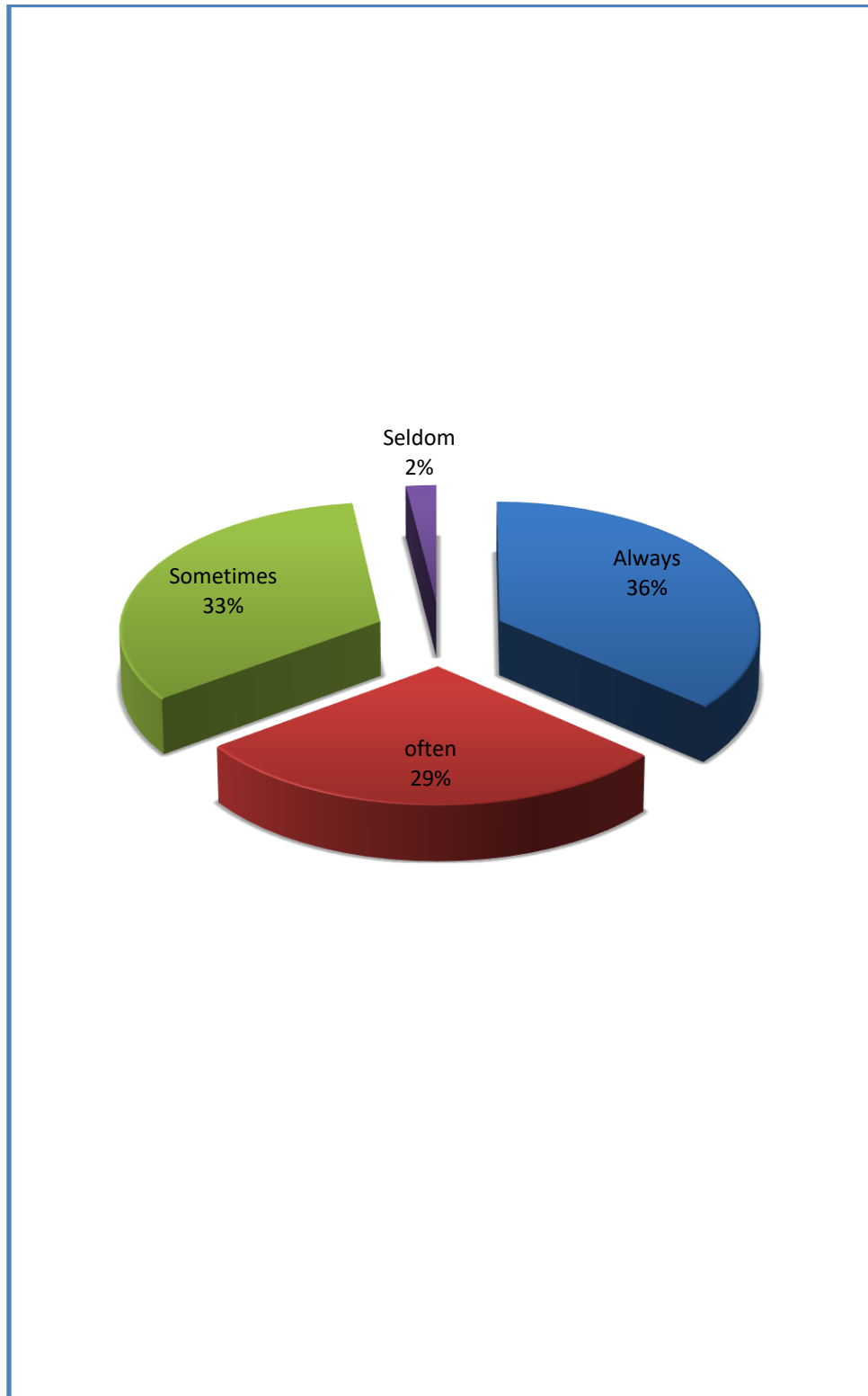


3.8.2 SELF-RATING SCALE OF SELF-DIRECTED LEARNING

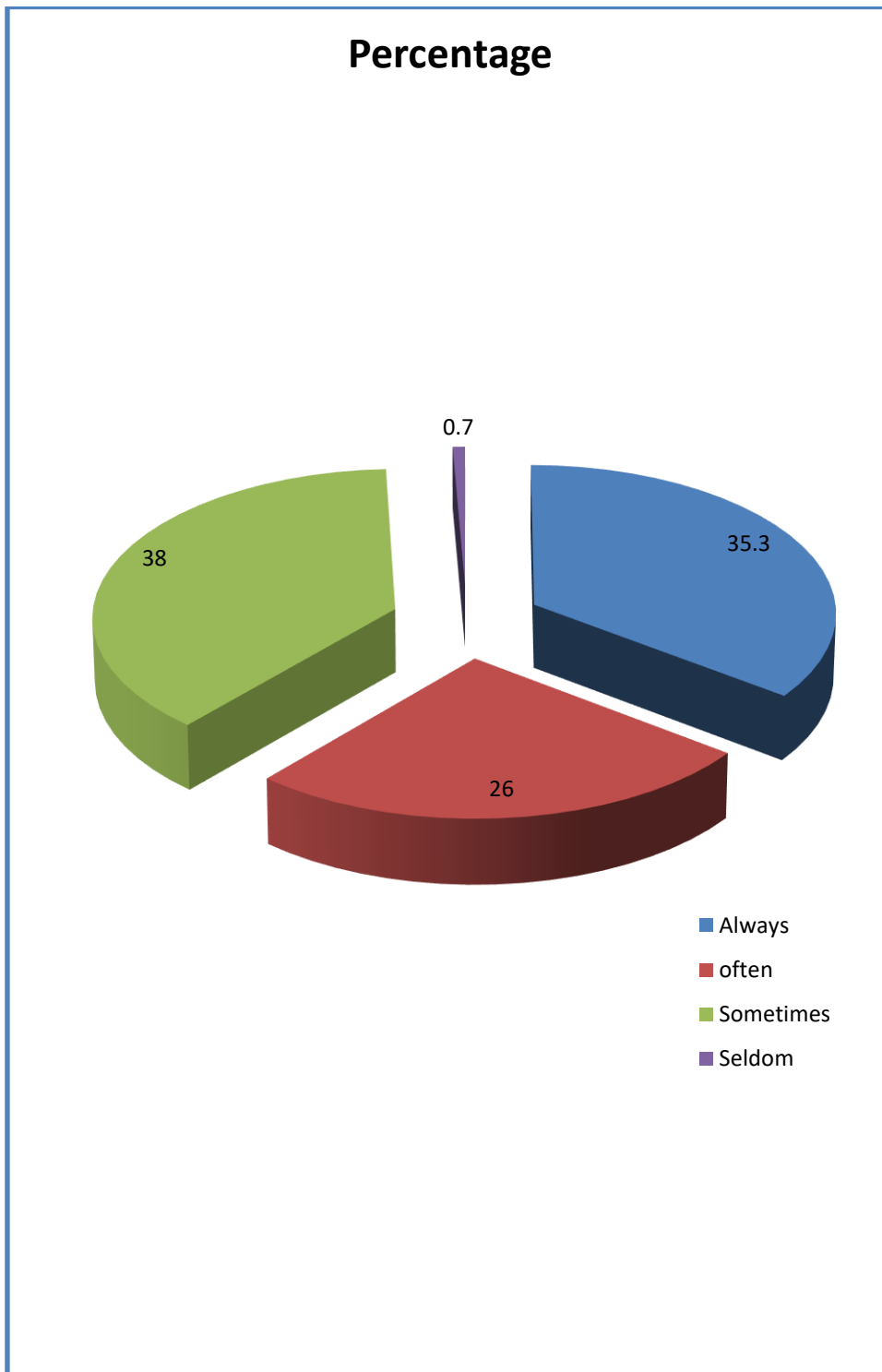
1. Are you able to select the best method for your own learning?



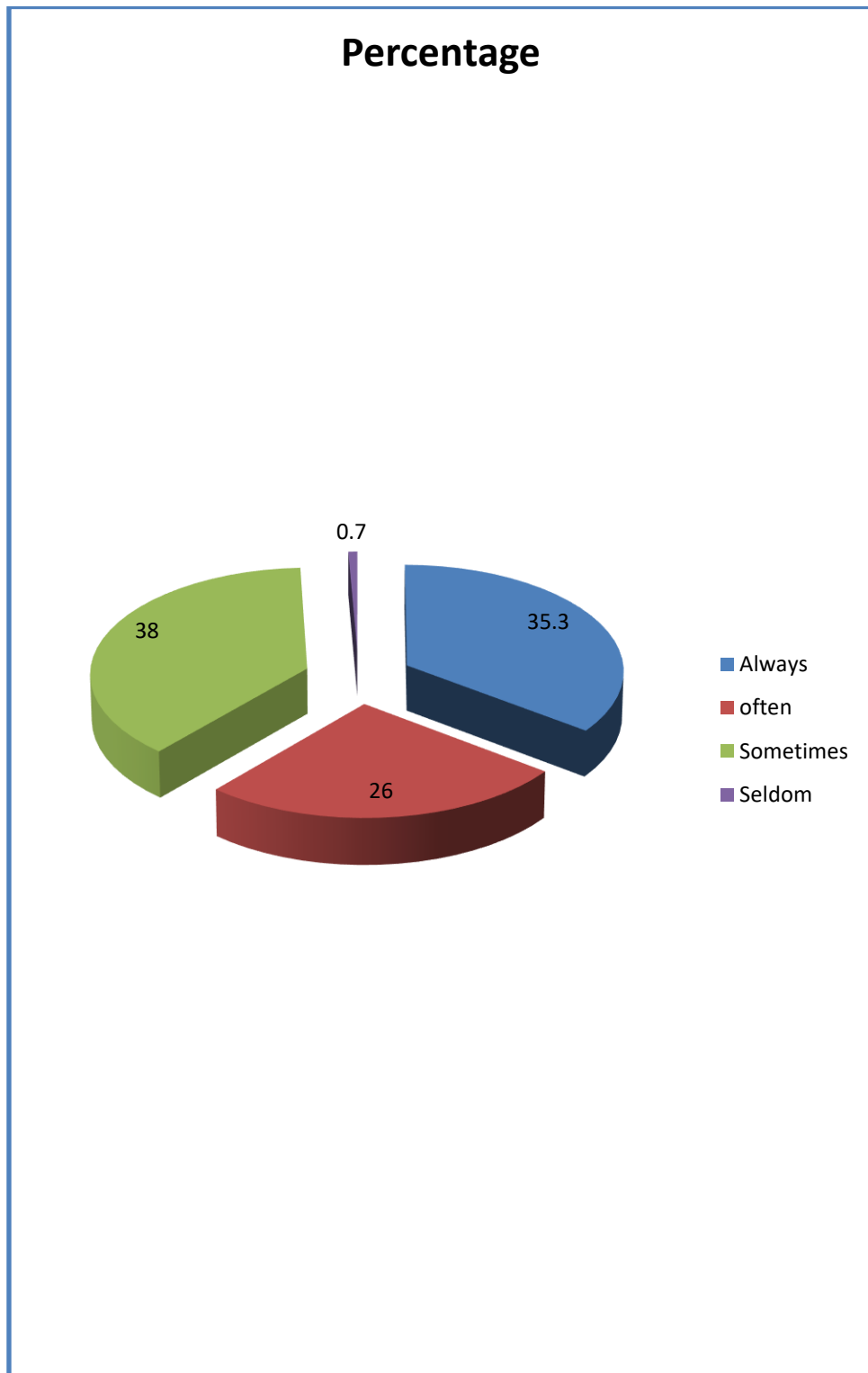
2. Are you able to identify your own learning needs?



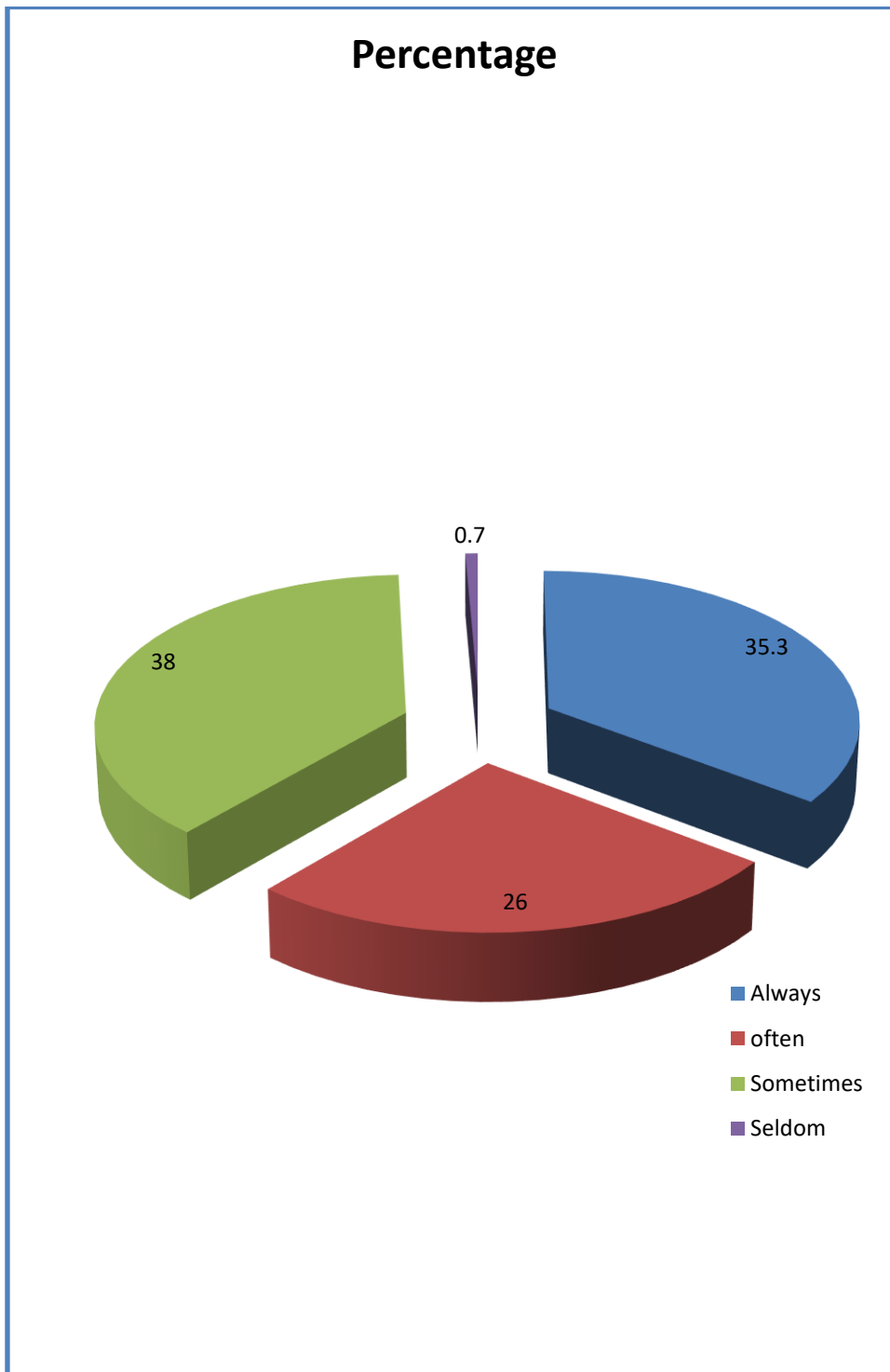
3. Are you up to date on different available learning resources?



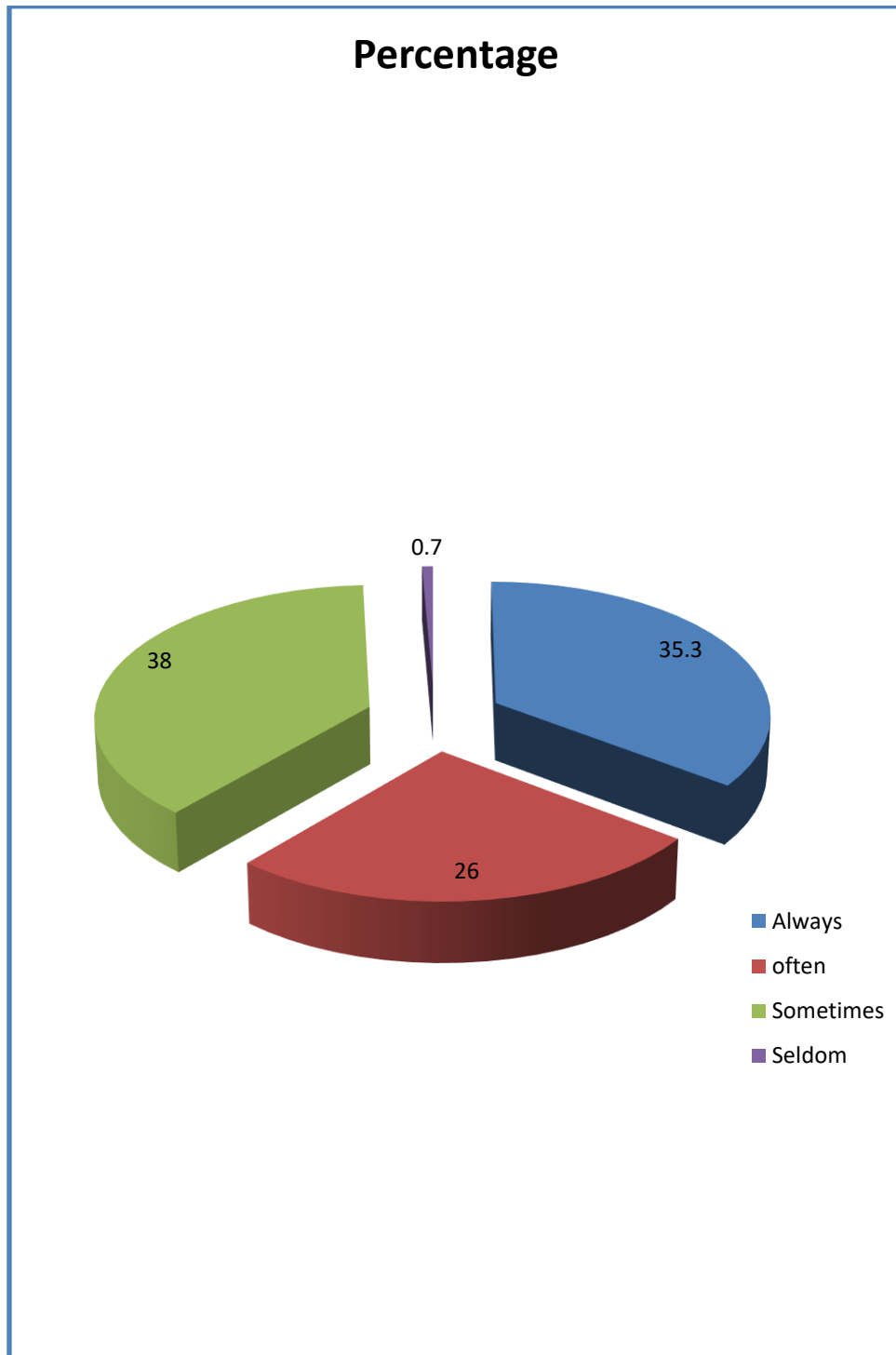
4. You always take responsibility for your own learning.



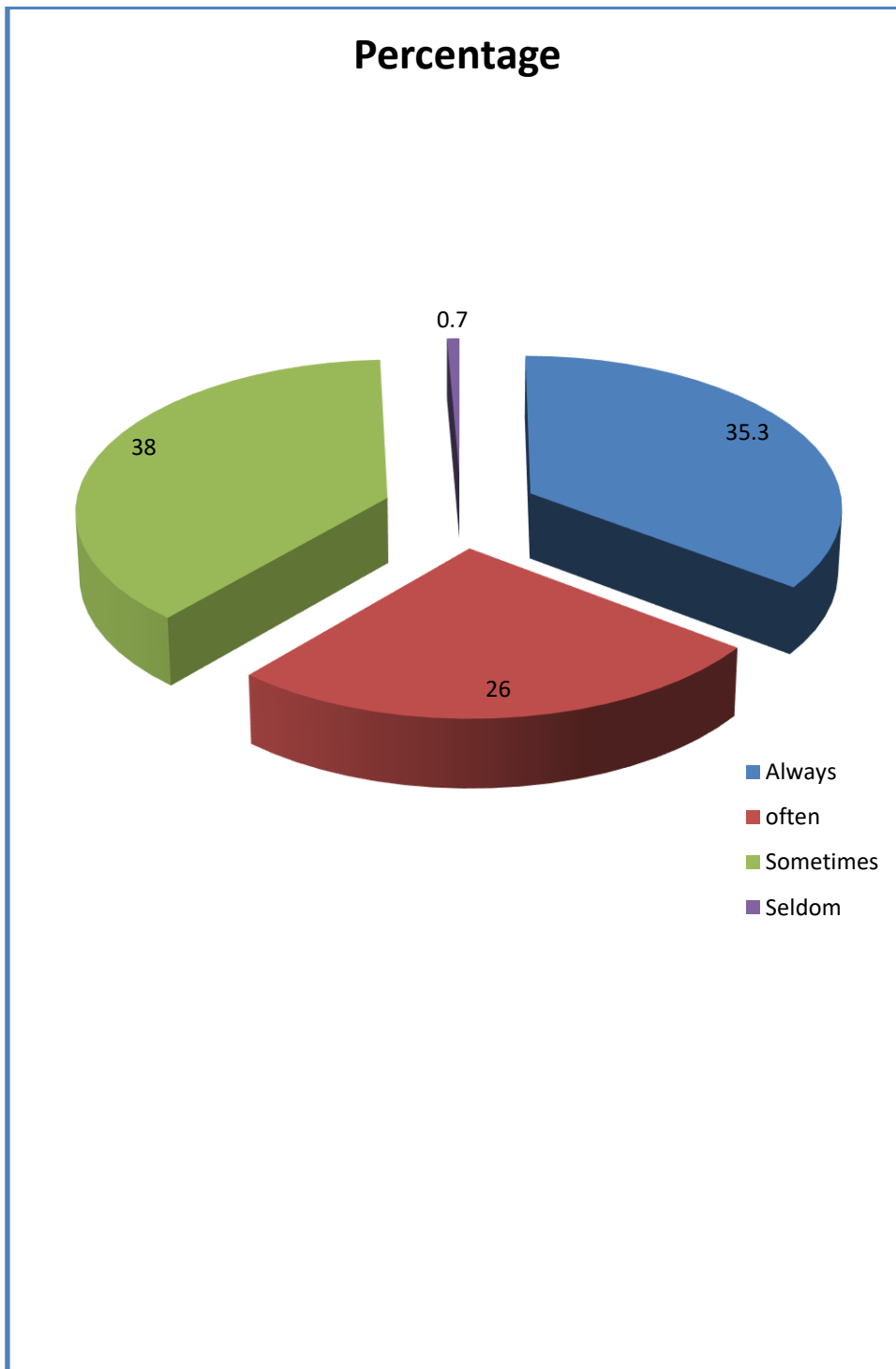
5. You consider teachers as a facilitator.



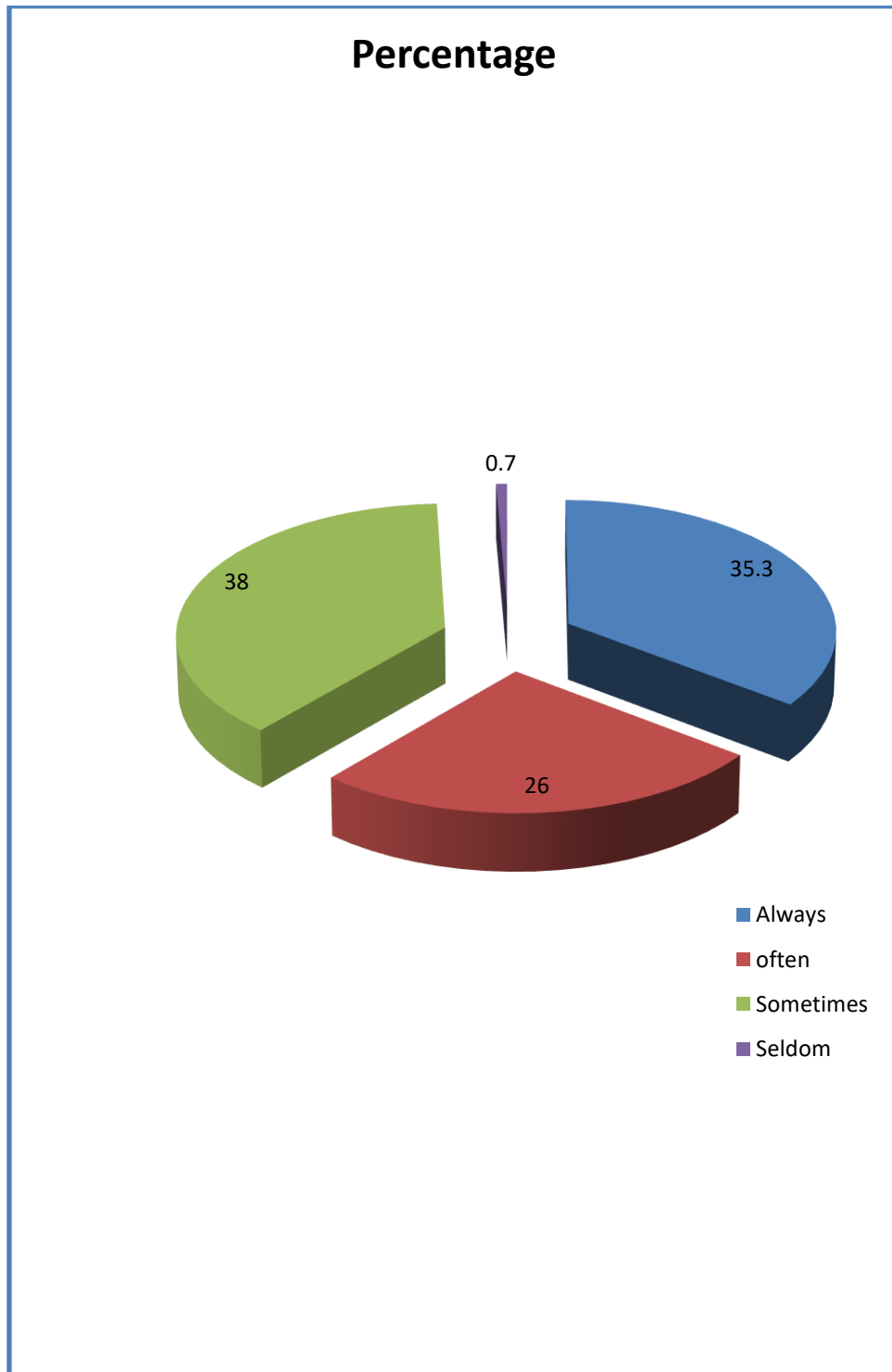
6. Do you think interactive teaching-learning sessions are more effective than just listening to lectures?



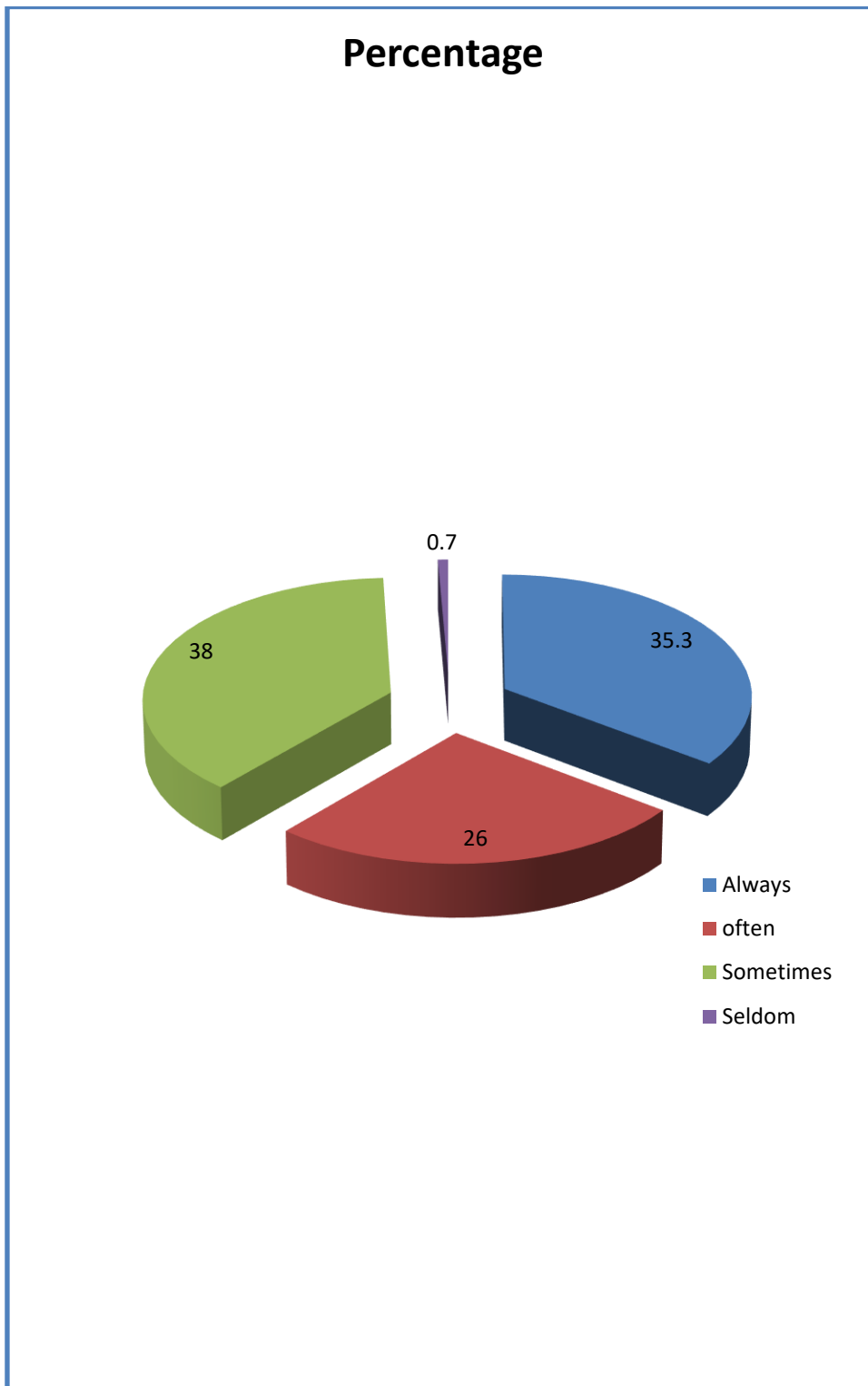
7. Do you find learning from case studies useful?



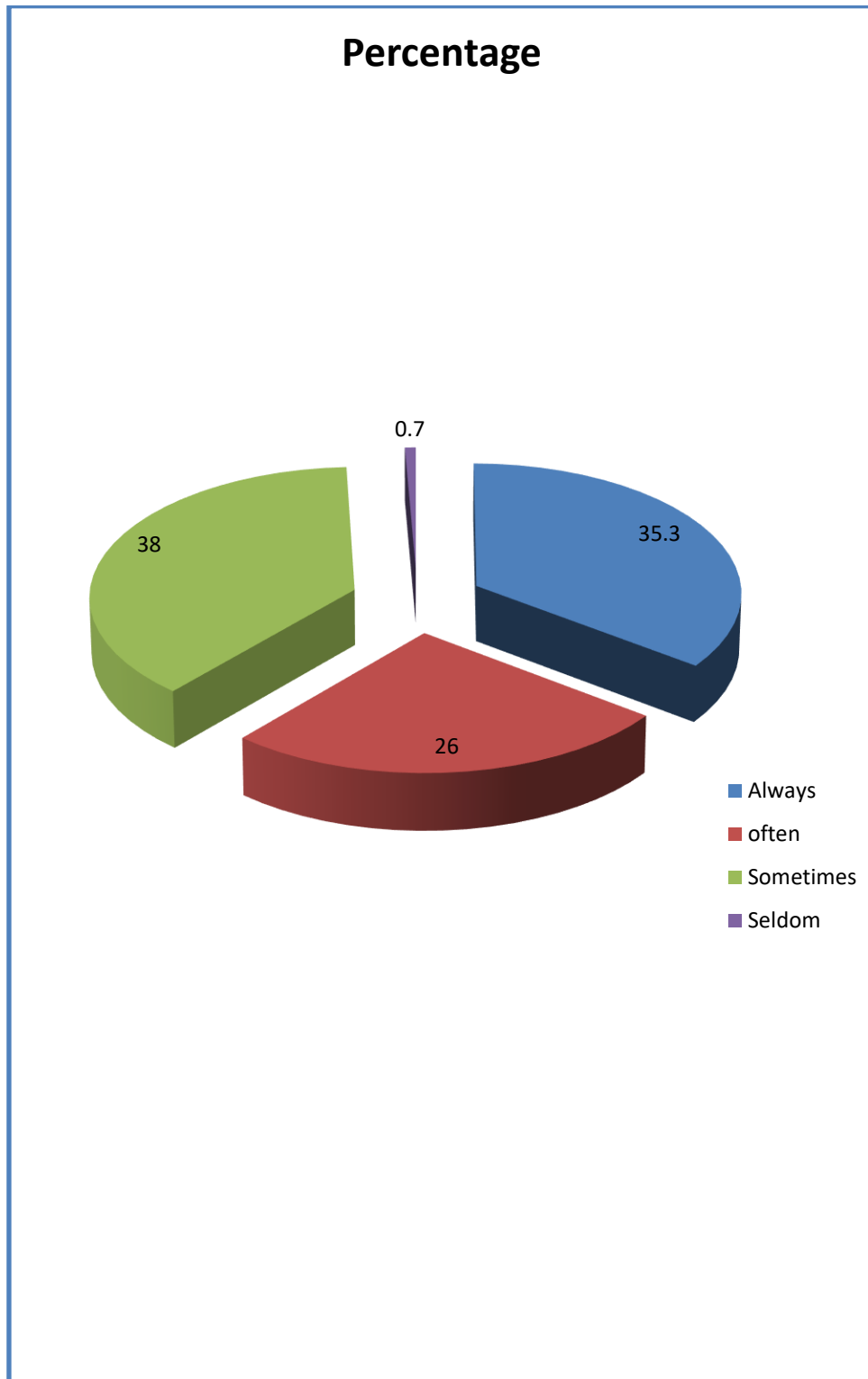
8. Do you think that modern educational interactive technology enhances your learning process?



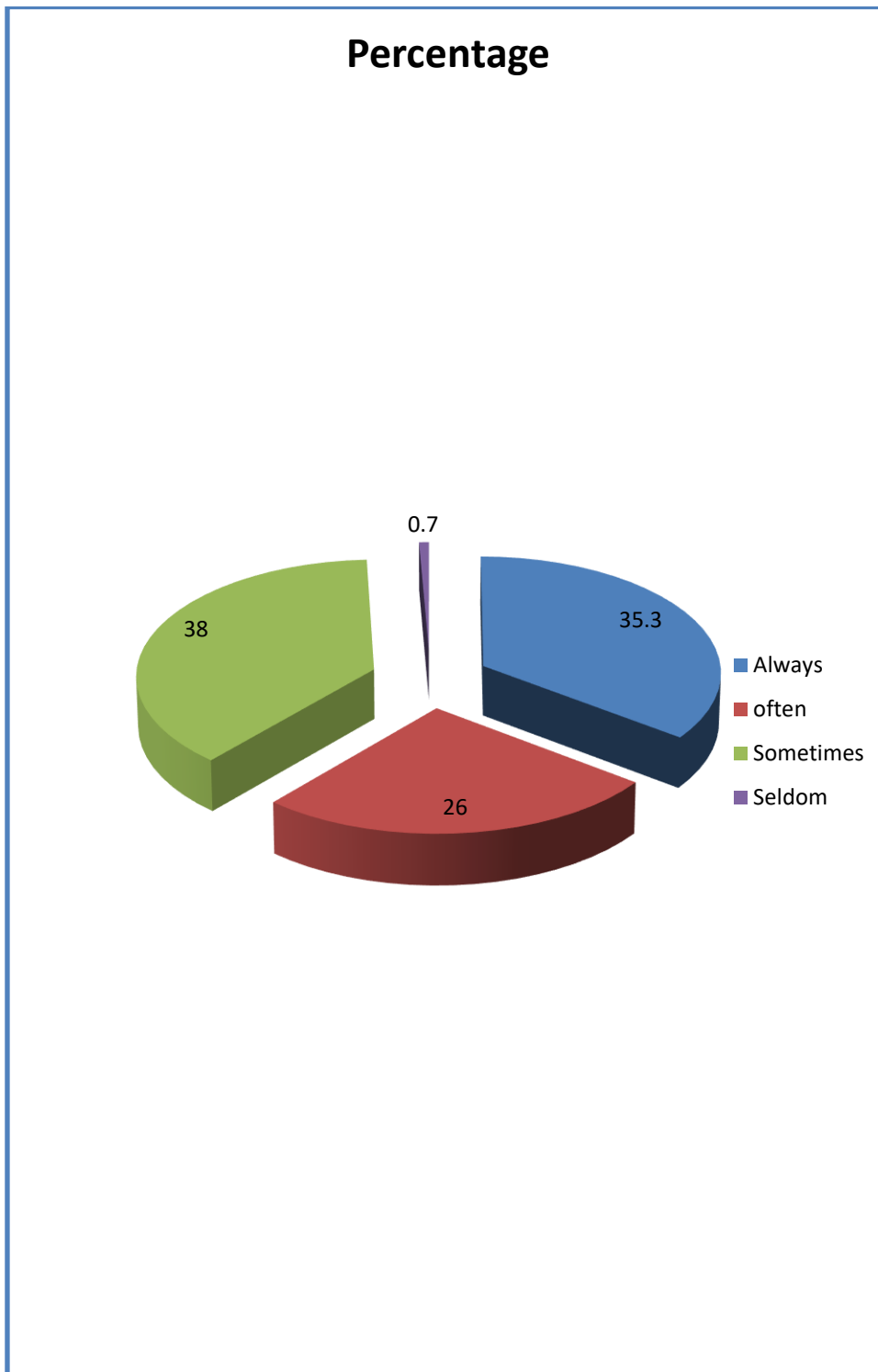
9. Do you think "Role Play" is a useful method for complex learning?



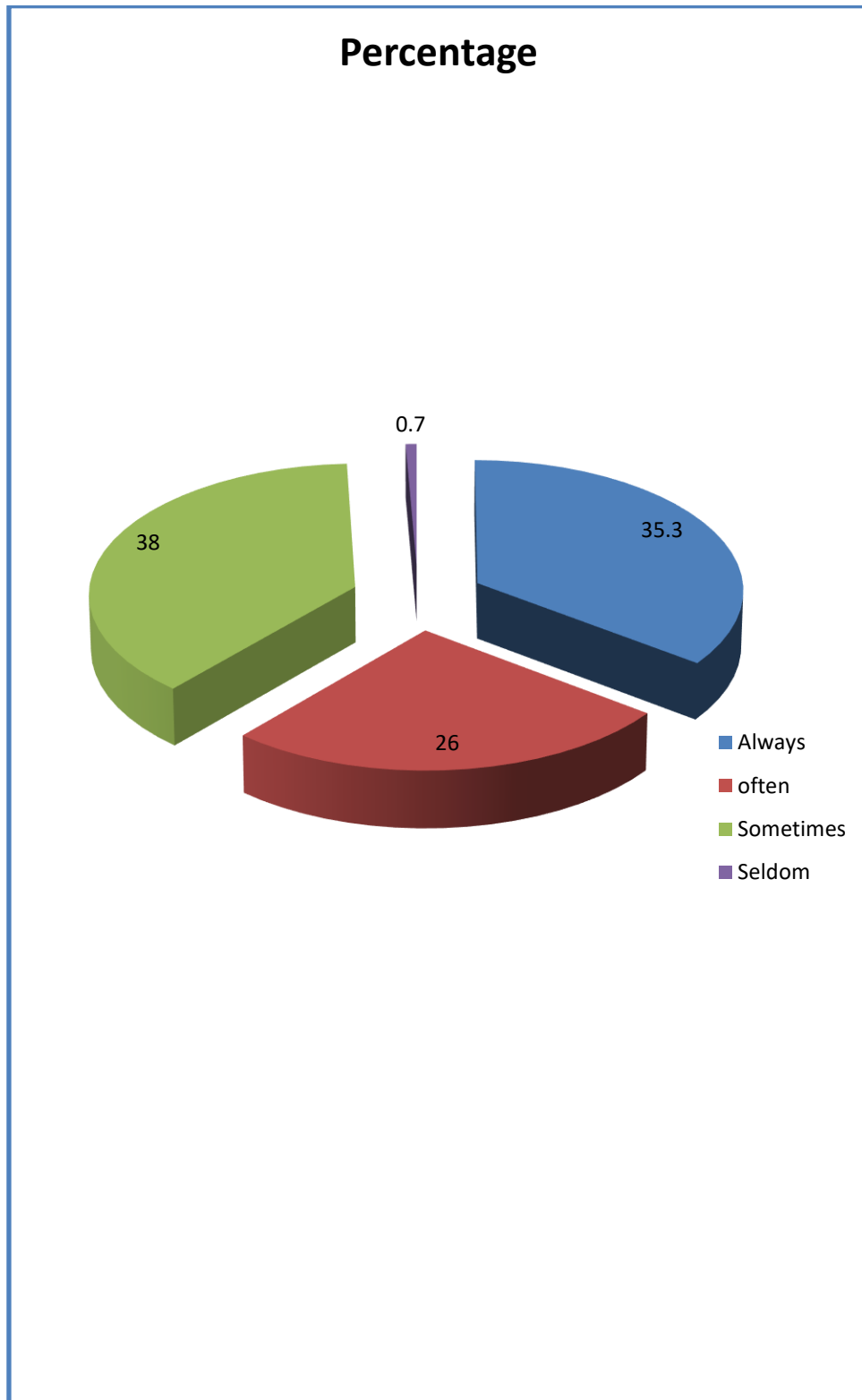
10. Are you able to identify the important points when reading a chapter or an article?



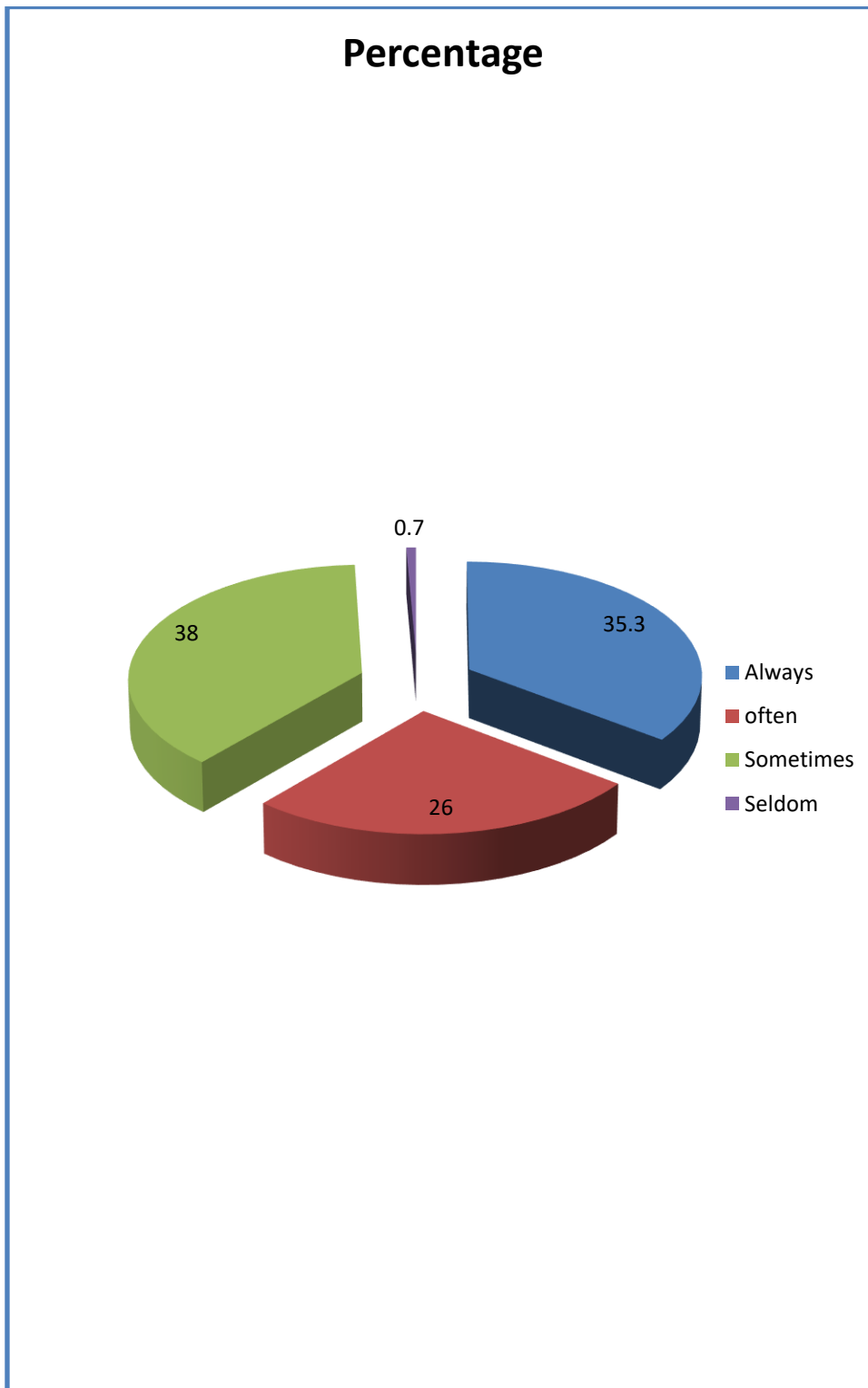
11. Are you able to use information technology effectively?



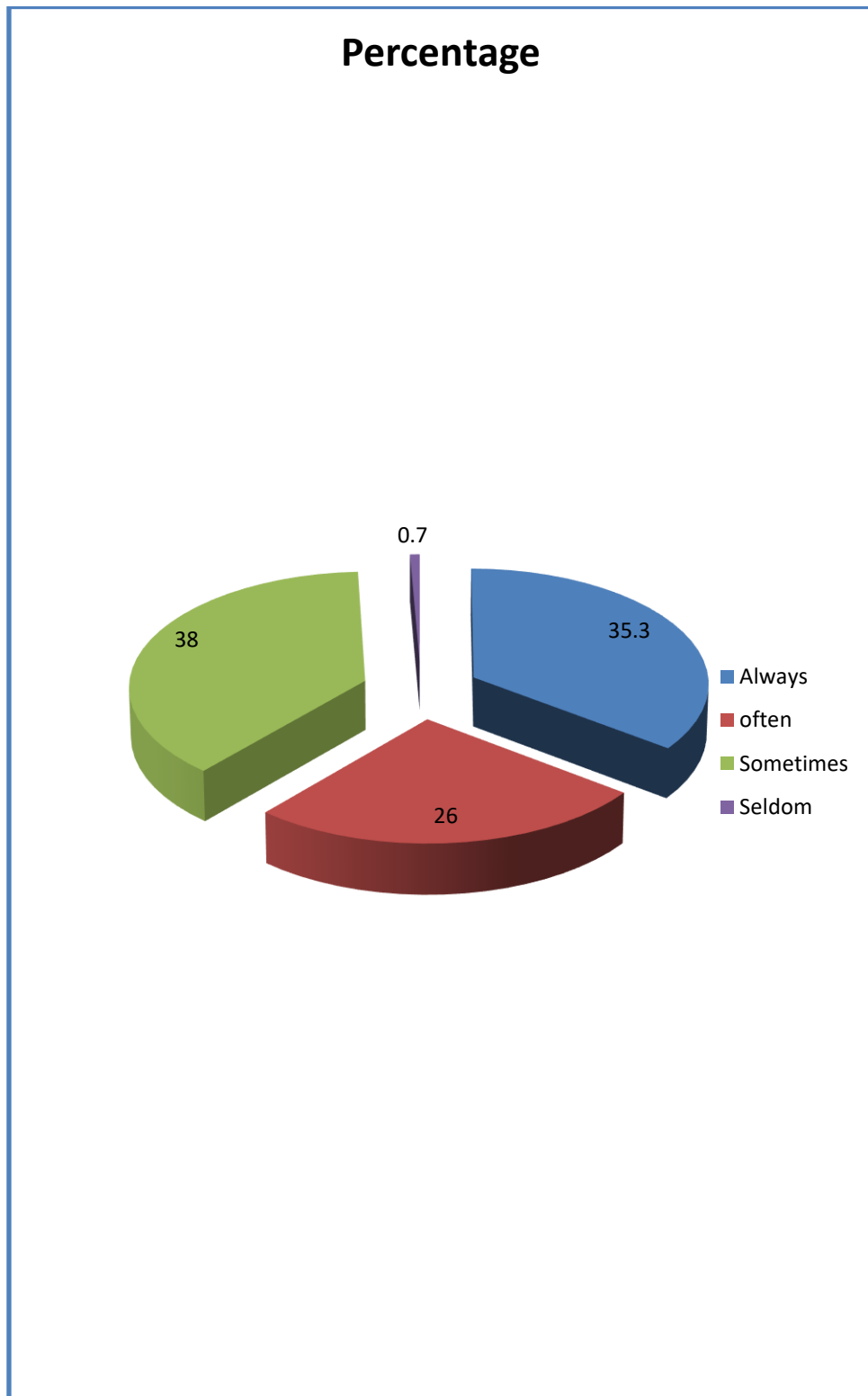
12. Do you enjoy exploring the information beyond the prescribed course objectives?



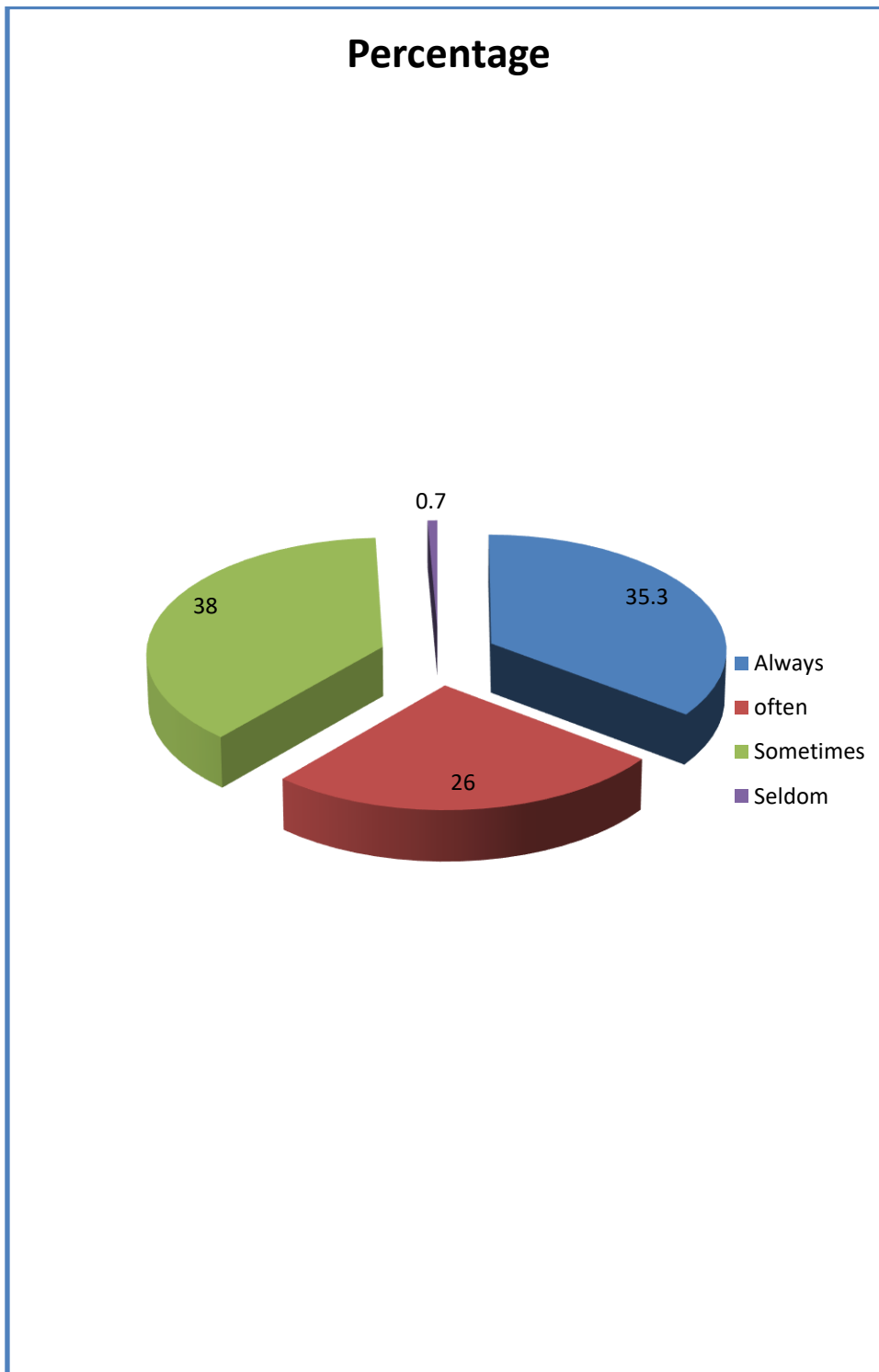
13. Are you able to monitor your own learning progress?



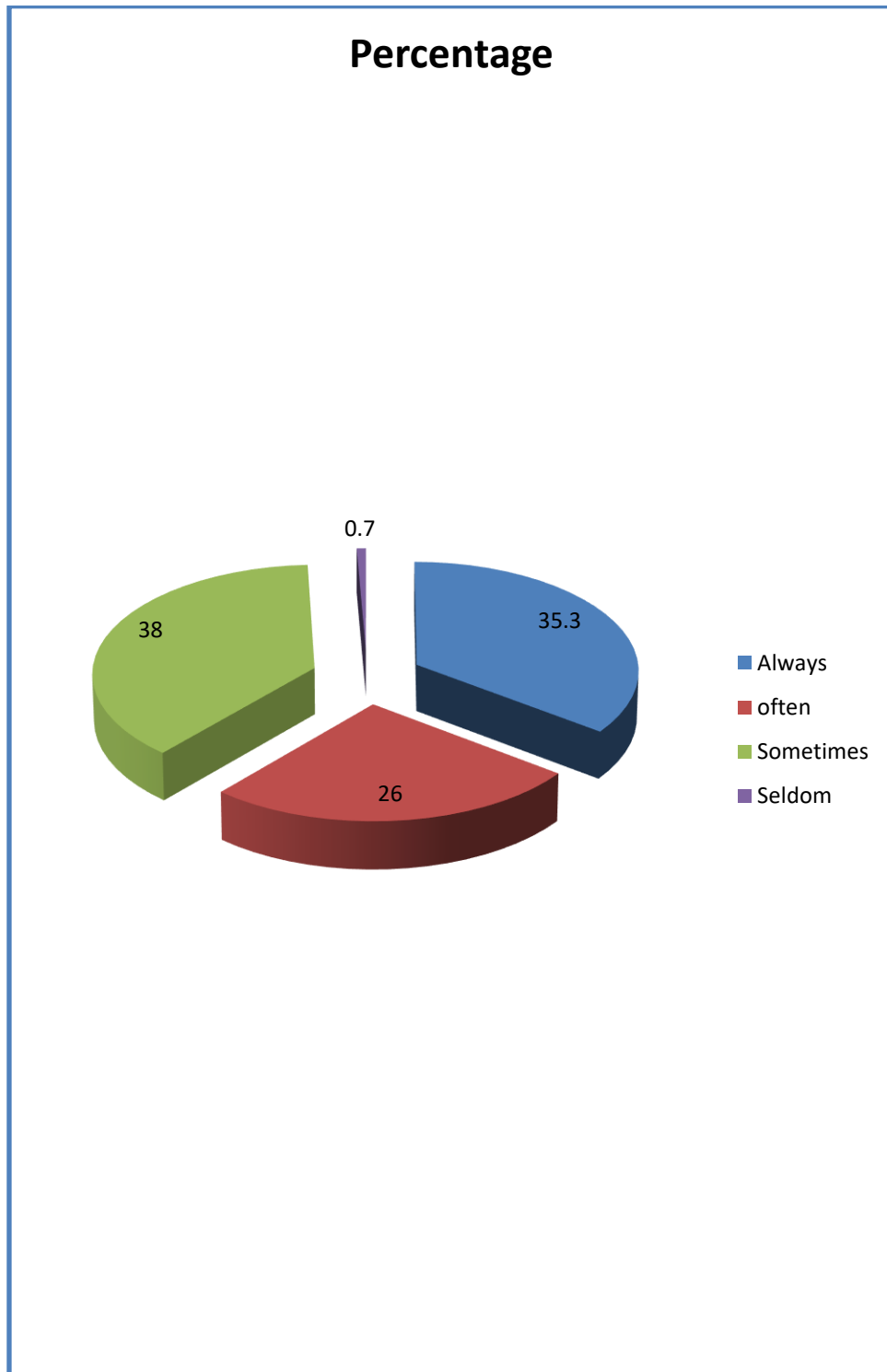
14. Are you able to identify your areas of strength and weaknesses?



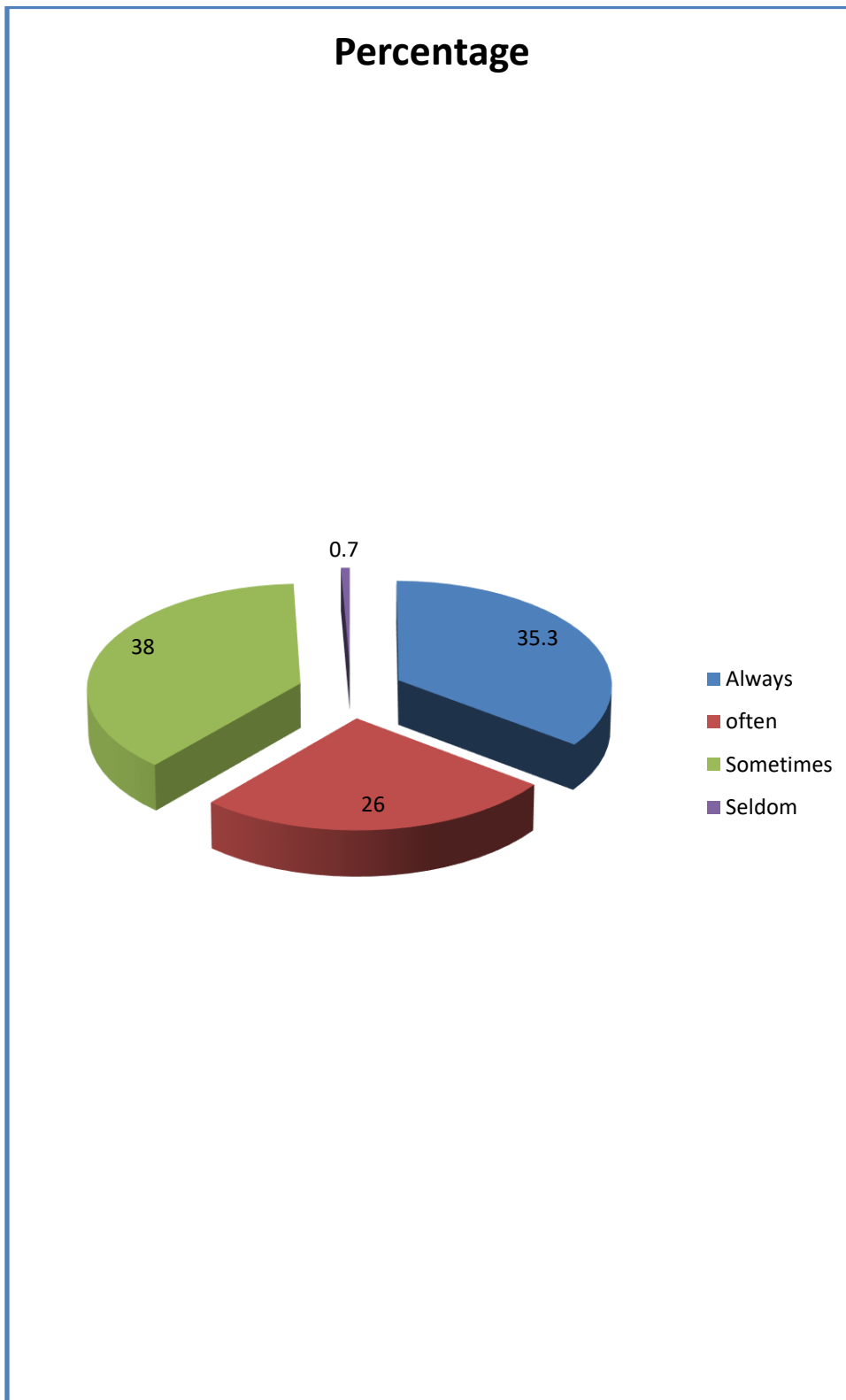
15. Do success and failure both inspire you to further learning?



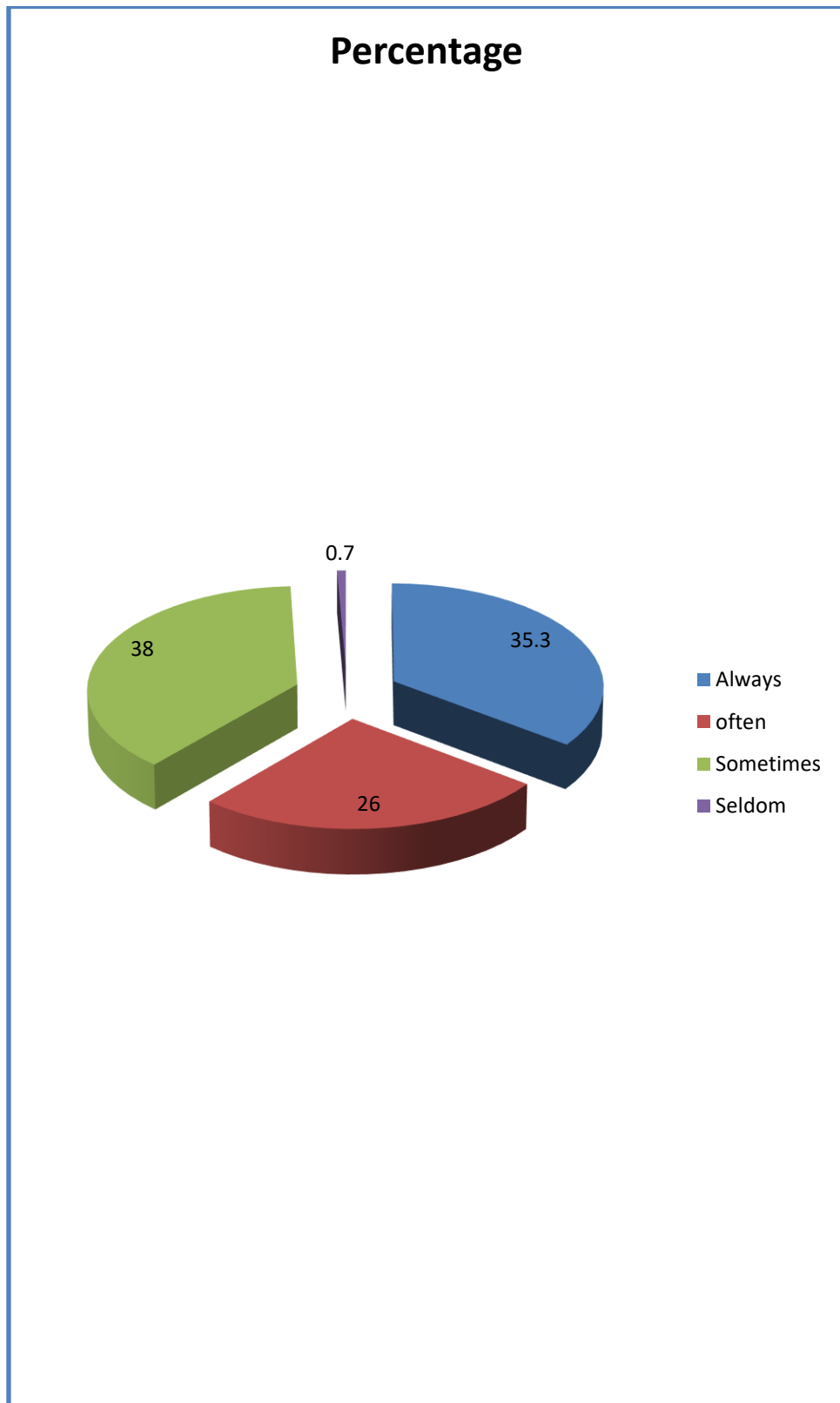
16. Are you able to identify the areas for further development in whatever you have accomplished?



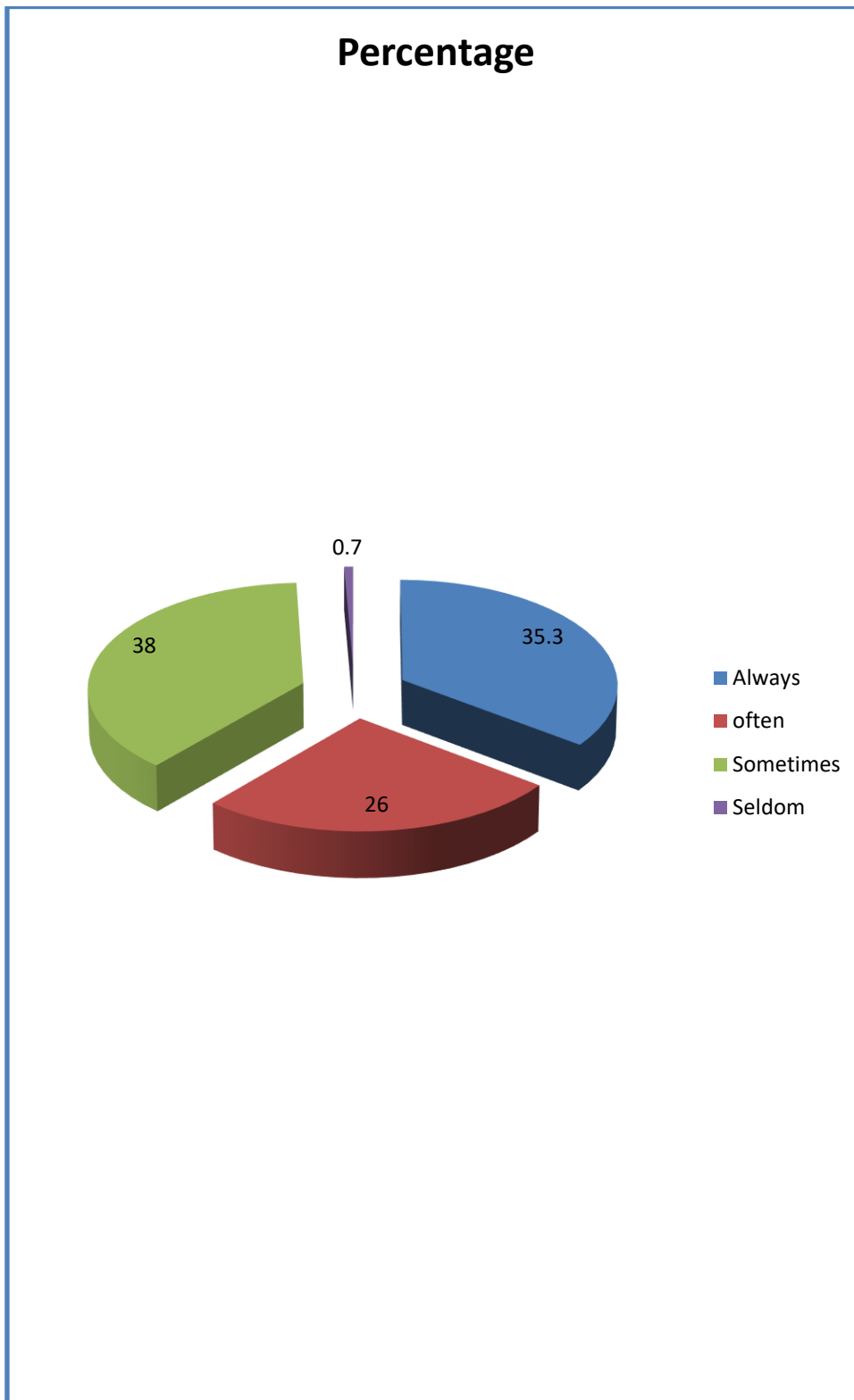
17. Are you able to identify your role within a group?



18. Do you make use of any opportunities that come across?

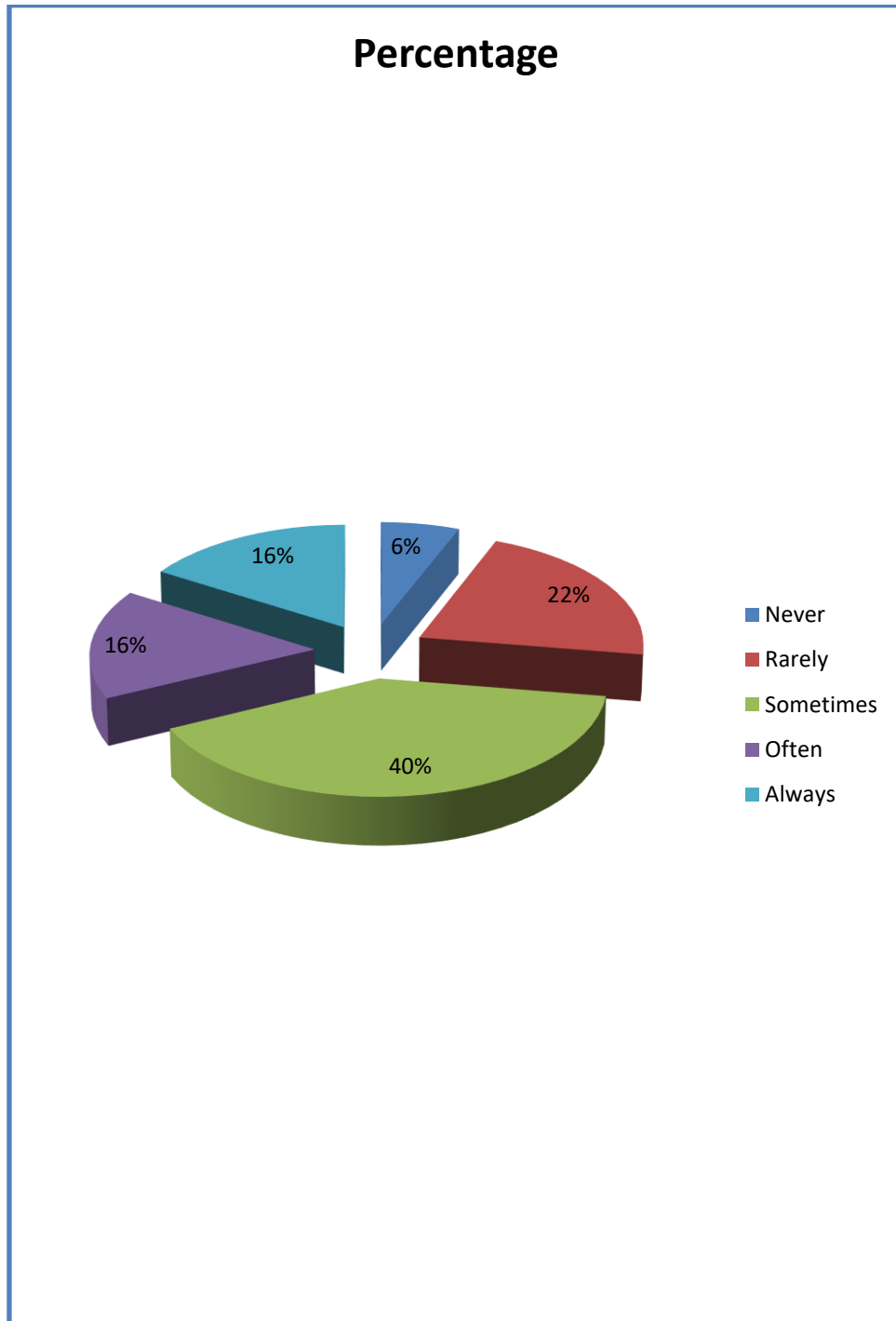


19. Are you able to maintain good interpersonal relationships with others?

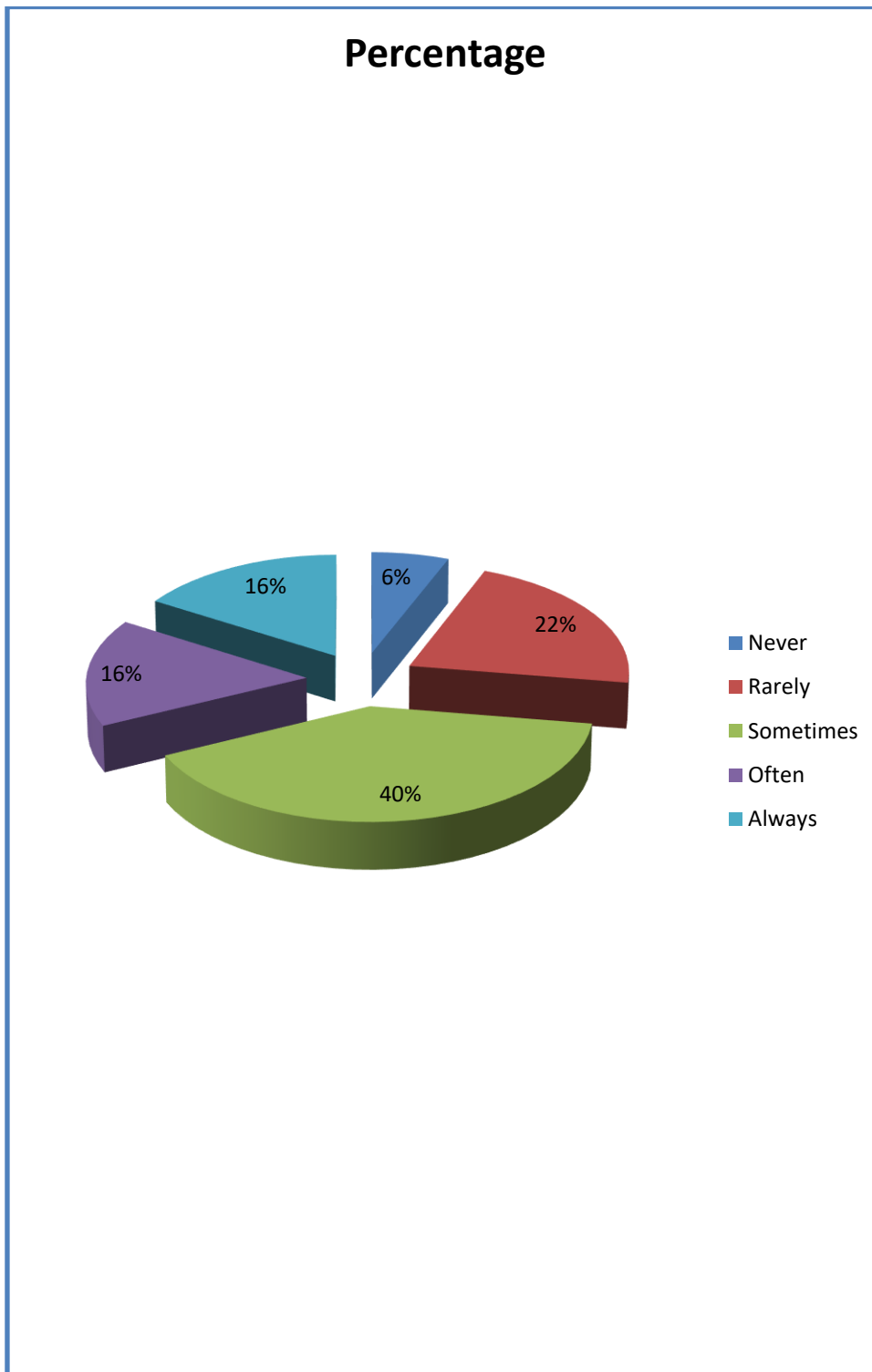


3.8.3 Work Engagement Scale

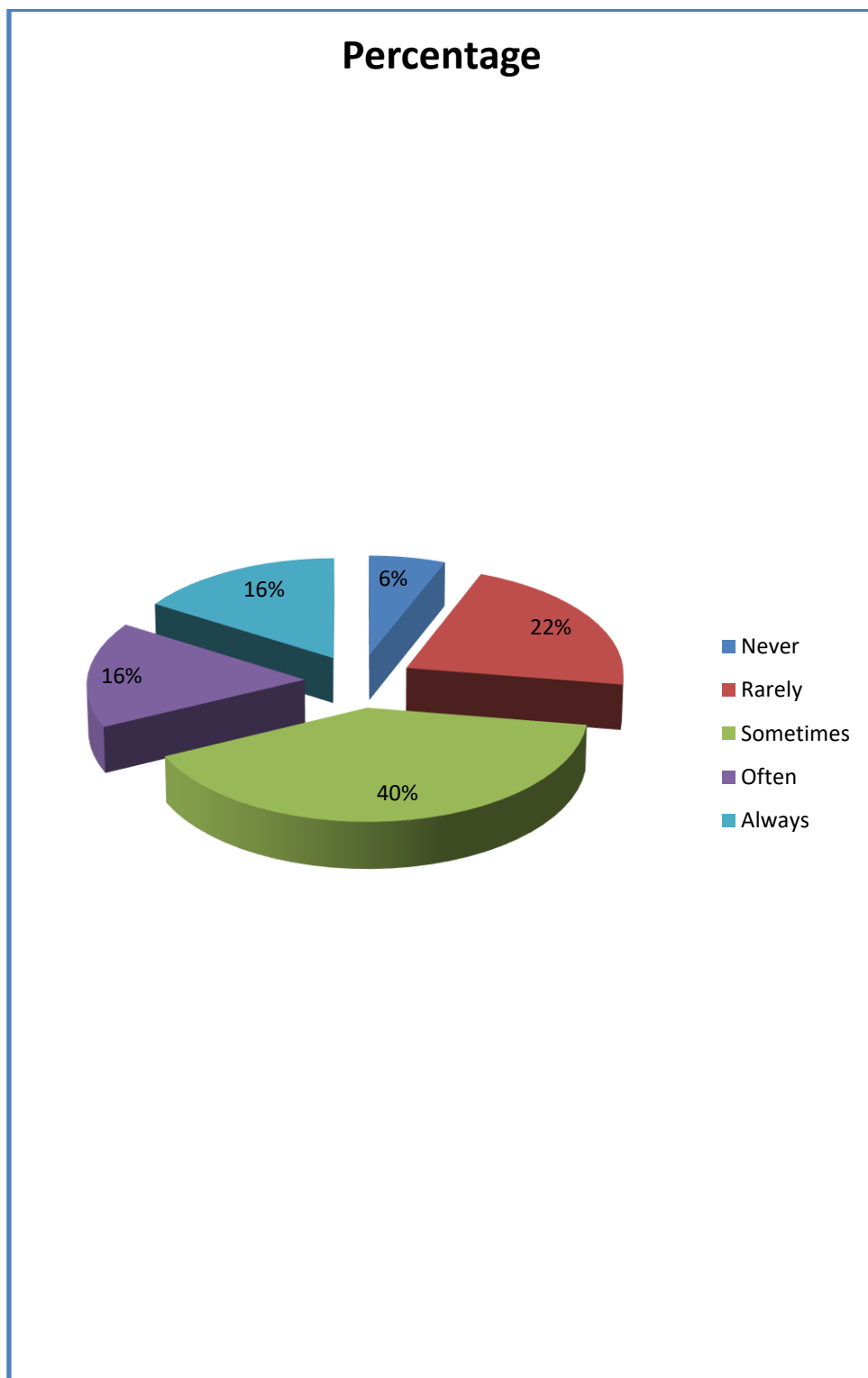
1. When you are doing your work as a student you feel bursting with energy.



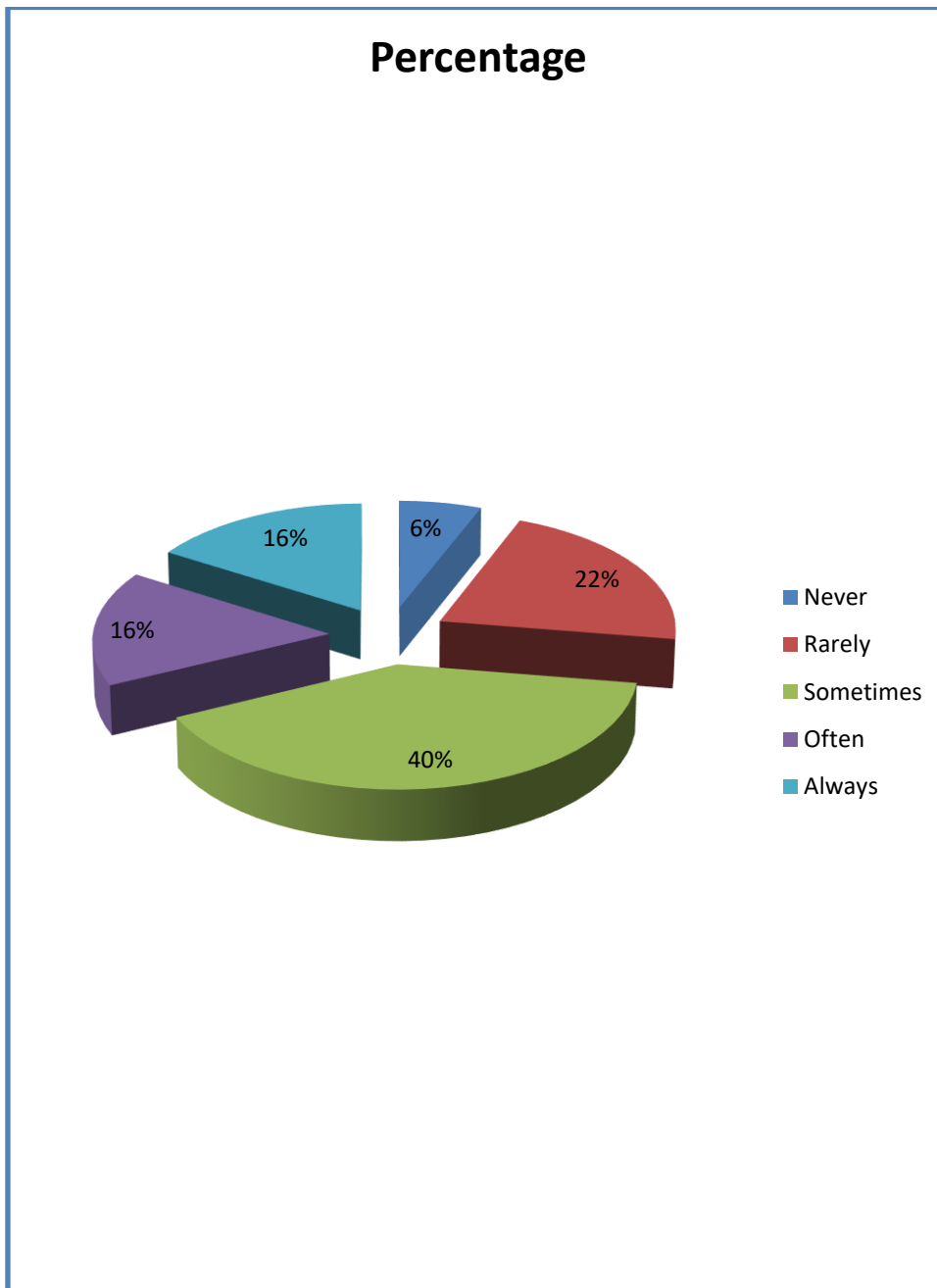
2. You feel energetic and capable when you are studying or going to class.



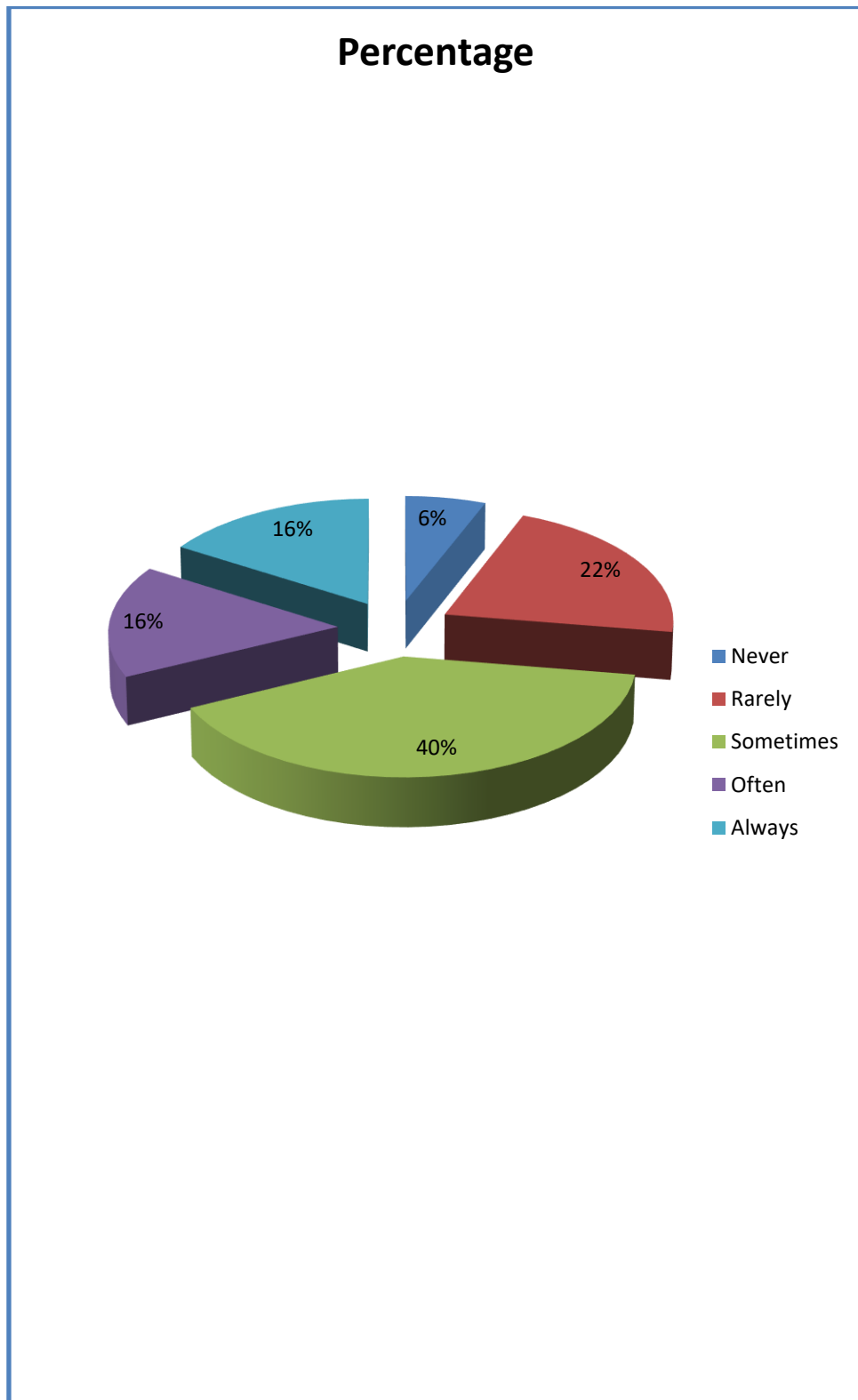
3. You are enthusiastic about your studies.



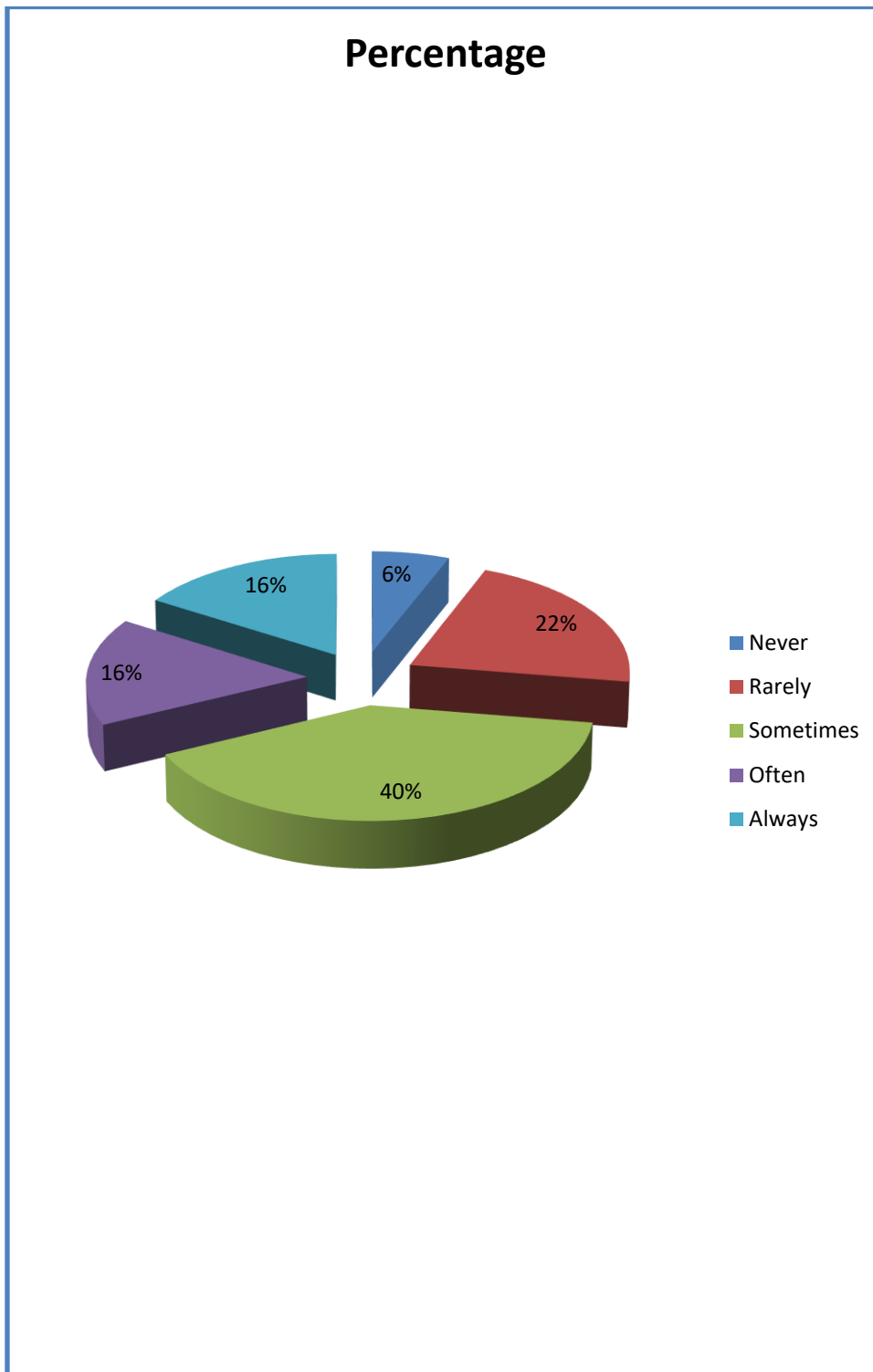
4. Your studies inspire you.



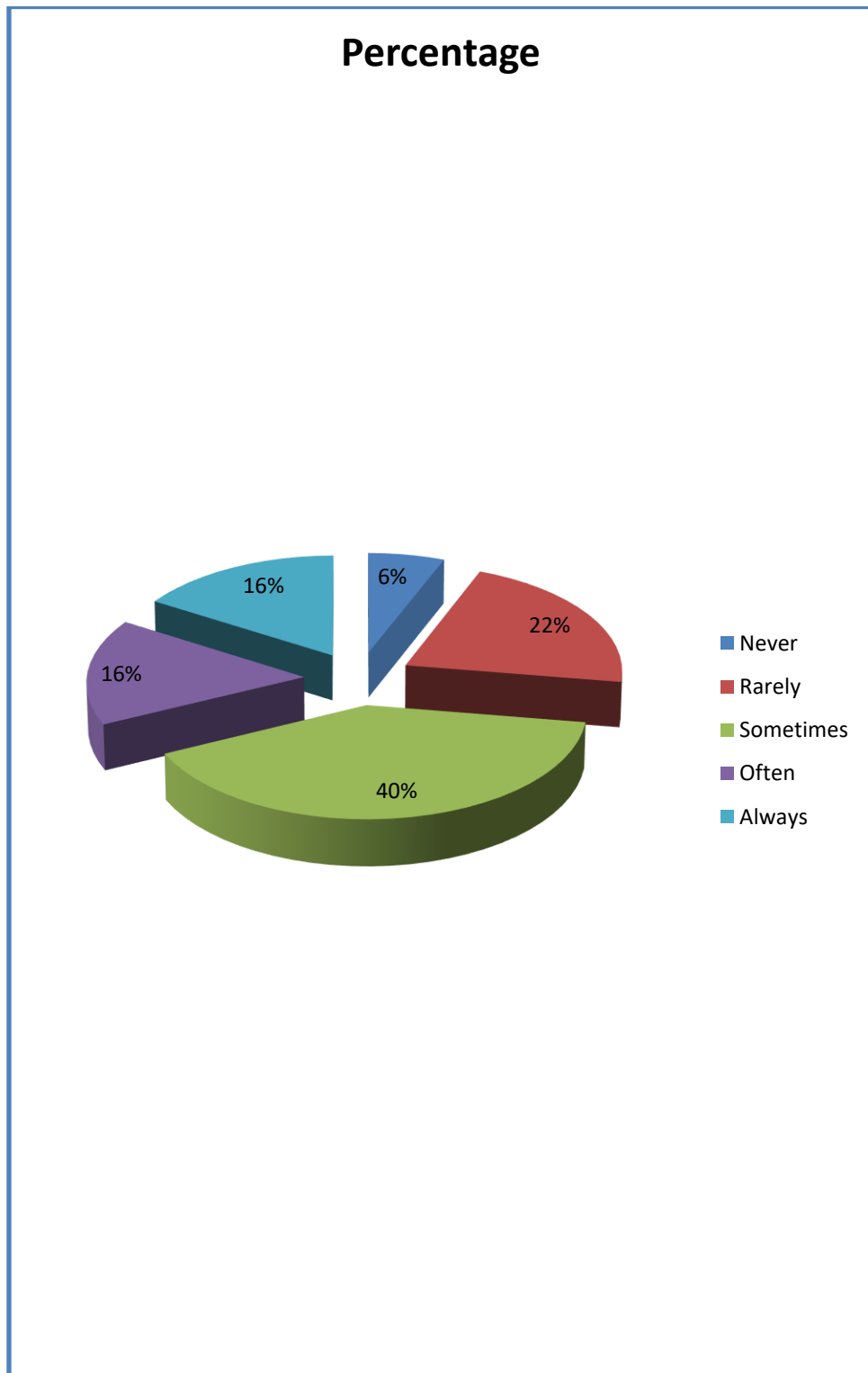
5. You feel like going to class when you get up in the morning.



6. When you study intensely you feel happy?



7. When you are studying you get carried away.



3.9 DATA ANALYSIS TOOLS

The full description of each of the four statistical techniques is provided below.

3.9.1 Descriptive Statistics:

The basic properties of the data in a study are described using descriptive statistics. It helps provide succinct summaries of the samples. They act as the basis for all types of quantitative data analysis. In other words, it only discusses the accuracy of the data or its implications. It expertly separates a lot of data. In descriptive statistics, central tendency measures like the mean, median, and mode are frequently utilised. In descriptive statistics, metrics that measure central tendency, variability, or dispersion are used. However, when quantifying variability, the key issue is the data's dispersion. Measuring central tendency favours the median or average values of data sets.

3.9.2 Inferential Statistics:

From our data, inferential statistics are utilised to draw conclusions about circumstances that are more widespread. It assists the researcher in drawing a conclusion that goes beyond the limitations of the currently available material. For example, based on the sample data, one can apply inferential statistics to infer what the population would think. As a result, inferential statistics are necessary in order to derive generalisations from our data. The t-test, ANOVA, ANCOVA, regression analysis, component analysis, multidimensional scaling, cluster analysis, discriminant function analysis, and other multivariate techniques are included in this.

3.9.3 Multiple Linear Regressions

By taking into account the beta coefficients of numerous independent variables, multiple linear regressions aid in the prediction of the dependent variables. Knowing how much the dependent variable is influenced by the independent variables, as well as whether or not the influence is substantial, is useful. Following the advice of Brace, Kemp, and Snelgar (2006), various presumptions must be met before using multiple linear regressions.

- The independent variable and dependent variable must have a linear relationship.
- The dependent variable should be measured on a continuous scale, such as a ratio or interval.
- The measurement units for predictor variables are ordinal, interval, and ratio.
- The number of replies needs to be greater than the number of investigated predictor variables.

By verifying the aforementioned premises, it was possible to determine the relationship between independent variables such as technology use and academic performance, student engagement, and self-directed learning.

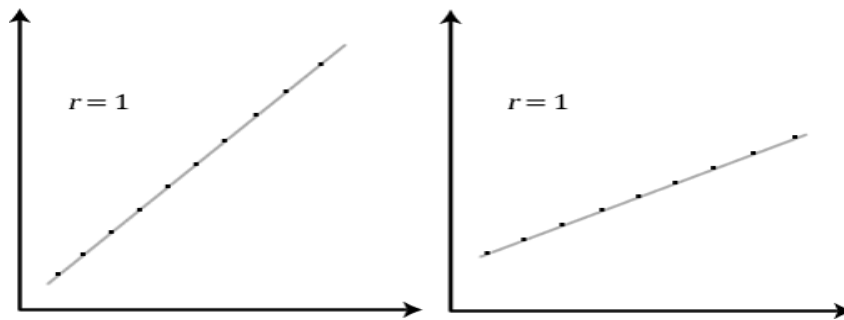
3.9.4 Pearson correlation coefficient:

The letter r stands for a measure of the strength of a linear relationship between two variables. The line that best fits the data from the two variables is determined using the Pearson product moment correlation. The Pearson correlation coefficient, or r , has a possible range of values between $+1$ and -1 . A value of 0 indicates there is no correlation between the two variables.

If it has a value greater than 0 , there is a positive correlation, which means that as one variable's value rises, the other variable's value rises along with it. Additionally, a value less than 0 indicates a negative link between two variables, which means that when one variable's value rises, the value of the other variable falls concurrently.

Another thing to keep in mind is that the slope of the line of best fit is not represented by the Pearson correlation coefficient, or r , in this case. As a result, a Pearson correlation value of $+1$ does not necessarily imply that an increase in one variable is accompanied by an increase in the other. The line of best fit and the data points are simply identical, which suggests that there is no variation between them.

The diagrammatic representation of the same is given below:



3.10 CONCEPTUAL FRAME WORK WITH HYPOTHESIS

Different variable of interest has been identified on the basis of previous literature review, objective of the study and pilot study. The hypotheses proposed are as follows:

Hypothesis 1:

H1 There is significant relationship between ICT use and student engagement.

H0 There is no significant relationship between ICT use and student engagement.

Hypothesis 2:

H1 There is significant relationship between ICT use and SDL.

H0 There is no significant relationship between ICT use and SDL.

Hypothesis 3:

H1 There is significant relationship between ICT use and academic performance.

H0 There is no significant relationship between ICT use and academic performance.

Hypothesis 4:

H1 There is significant relationship between student engagement and SDL.

H0 There is no significant relationship between student engagement and SDL.

Hypothesis 5:

H1 There is significant relationship between SDL and academic performance.

H0 There is no significant relationship between SDL and academic performance.

Hypothesis 6:

- H1 There is significant relationship between ICT use and SDL via Student engagement.
- H0 There is no significant relationship between ICT use and SDL via student engagement.

Hypothesis 7:

- H1 There is significant relationship between ICT use and academic performance via SDL.
- H0 There is no significant relationship between ICT use and academic performance via SDL.

3.10.1 Conceptual Framework for Depicting the Interrelationship between the Variables

The use of information and communication technologies (ICT) in education has increased significantly as education has become more widely available to people around the world. It is reported that the availability of ICT-enabled tools has improved self-directed learning. A thorough review of the literature revealed that online education, easier access to technology, individualised learning possibilities, and new information sources have all changed the environment for self-directed learning. Institutions are urging instructors to adopt self-directed learning in the classroom as they become more aware of its benefits. The purpose of the current study is to look into how information and communication technologies (ICT) are used and how they impact post-graduate MBA students' academic performance. Academic achievement (AP), self-directed learning (SDL), and student engagement (SE) are all examined in the current study as dependent variables. In order to investigate and ascertain the impact of information and communication technologies (ICT) on student engagement, self-directed learning, and students' academic performance and then further examine the correlation between these variables, a conceptual framework has been developed based on a thorough literature review.

We make a few claims, which are then schematically shown in Figure-

Conceptual Model for Predicting the interrelations between Information & Communication Technologies (ICT), student engagement, self-directed learning and academic performance

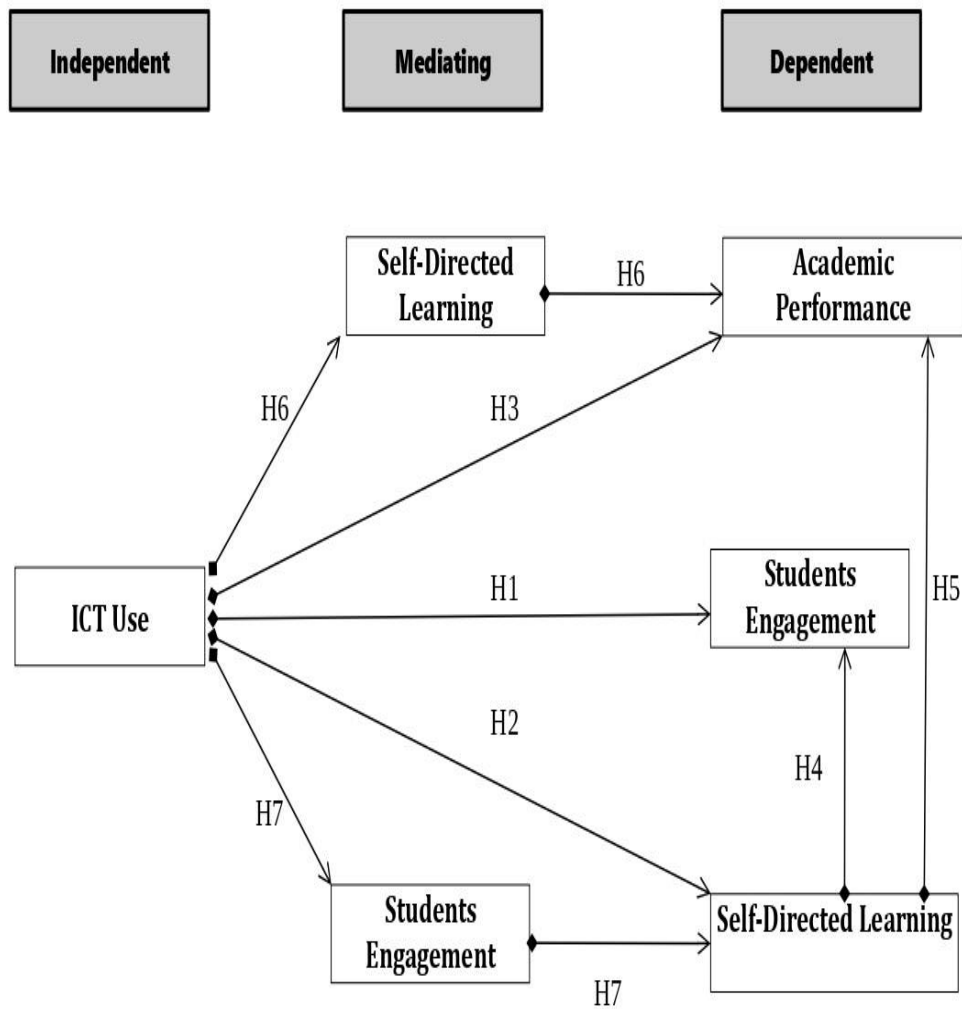


Figure 3.1: Conceptual Model to Predict the Relationships

Information and communication technologies (ICT) and student engagement, self-directed learning, and academic success are clearly related, according to the presented theoretical model. Under the premise that the idea of ICT (operationalized as an independent variable) has a substantial link with the results, the claims are further developed into study hypotheses (H1, H2, and H3) (operationalized as dependent variables). Two other topics, student involvement and self-directed learning, have

separately drawn the researcher's attention because of claims that they are connected to academic performance and attainment, both explicitly and implicitly. Based on the stated hypothesis (H4) that proposes a significant correlation between student engagement and SDL, the model portrays a direct relationship between the two in order to research and study the relationship between student engagement and self-directed learning (SDL) behaviour. The model's hypothesis (H5) is reflected by the presumption that SDL and academic achievement are strongly correlated. Additionally, it is thought that student engagement and learning (SDL) have an impact on students' general academic performance and achievement.

The literature review also highlighted how Information and Communication Technologies (ICT) play a significant role in how students behave in Self-directed learning (SDL) via student engagement, and how this behavior further influences how well students perform academically via self-directed learning (SDL) by the students.

The current study's aim was to explore the relationships between ICT use, student engagement, self-directed learning, and academic achievement. These assertions have been stated and their interrelationships have been schematically illustrated (H6 & H7) in the proposed theoretical framework. The current study investigates the connections between ICT as independent variables and student engagement, self-directed learning, and academic accomplishment as dependent variables.

3.11 CONCEPTUAL & OPERATIONAL DEFINITIONS OF VARIABLES

3.11.1 Information & Communication Technology (ICT):

Information technology (IT) is referred to as ICT, and its definition is rather broader. ICT is frequently used to refer to the fusion of many communication-related technologies. All such convergent technologies, such as the merging of telephone, Internet, and audiovisual networks (ISPs), exemplify ICT.

Information and communication technology (ICT) is defined for the purposes of the current study as a unified communication system that includes all communication technologies, such as the internet, wireless networks, phones, computers, software,

middleware, video-conferencing, social networking, and other media applications and services that allow users to access, retrieve, store, transmit, and manipulate information in a digital form. Information and communication technology (ICT) in education is further defined as ICT-enabled education, which facilitates an easier-to-manage and significantly smoother learning environment, improves access to and delivery of information, and ultimately increases learning experiences.

3.11.2 Self-Directed Learning:

Self-directed learning is the skill of a person or a learning approach that enables learners to take control of their own learning process. Self-directed learners typically diagnose their own learning needs, select their own learning objectives, devise their own learning strategies, and evaluate their own learning performances and outcomes. This is described as a model that demonstrates how individuals take ownership and initiative to establish their own objectives and plans of action in order to achieve their learning requirements. By using their own teaching or learning techniques, the students take the initiative to tutor themselves. The possibility that adult learners can self-direct their learning is increased by this style of learning, which is made up of a variety of characteristics, values, and interests.

3.11.3 Student Engagement:

The motivating force behind the teaching-learning process is student participation. This encapsulates the level of excitement and commitment a student has towards their work. Employees who are engaged are concerned about their work and the success of the company and believe that their contributions matter.

The word "student engagement" is used in this study to refer to the level of focus, interest, and involvement that students exhibit when learning or being taught via information and communication technology (ICT). The term "student engagement" in the context of ICT-enabled education refers to students' simultaneous behavioural, emotional, and cognitive engagement in particular ways, as well as their willingness and preparedness to take part in and succeed in their virtual learning process.

3.11.4 Academic Performance:

Academic performance is a measure of a student's aptitude and capability in a learning environment to exhibit acquired information, skills, and experiences in a number of contexts and circumstances, both inside and outside the classroom. Academic performance is a gauge of a student's academic accomplishments as well as how well they function in a classroom setting and manage the learning process.

Academic performance is defined for the purposes of the current study as the outcome of the efforts made by the students in the virtual environment. It represents results that show the degree to which a person has achieved particular learning objectives in an academic setting supported by ICT.