

CHAPTER III

RESEARCH METHODOLOGY

Research methodology is one of the essential components for conducting a research. It is a systematic and specific procedure or technique used for the purpose of identifying, selecting, processing, and analysing the available knowledge about the topic. A researcher achieves his/her goal with the appropriate research methodology only. Research methodology guides and provides a scientific platform to researcher for his/her research work.

3.1 Research Design

A research design provides a model for detailed plan of the investigation. It's kind of a blueprint for testing hypotheses and analysing the collected data. It also assesses and explores the potential relationship between dependent and independent variables. The research design is selected on the basis OF nature and objective of the research.

The main reason behind a research design is that it provides maximum information regarding the investigation at minimum cost. A research design helps researcher about how to collect data, how to test hypotheses and what type of statistical analysis should be done. It also enables the researcher to control unwanted variance. A good research design should minimise the bias and maximise the reliability. Therefore, the selection of a research design needs special attention.

In the present research, 3×2 factorial design is used which includes level of *Internet Addiction* and *Type of Courses*. Factorial design is used where two or more than two independent variables are studied simultaneously. In the factorial design,

values of independent variables are analysed in all the possible interactions. Factorial design is suitable for the researches where a particular problem is affected by a large number of factors. Factorial design can be of two types; simple factorial and complex factorial. The simple factorial design has minimum two independent variables/factors and a complex factorial design has three or more independent variables. Internet addiction is varied in three categories; *mild, moderate and severe* and Type of courses is varied in two categories; *non-professional and professional courses*.

3.2 Population and Sample

The population of the study was composed of students studying in professional and non-professional courses in the selected colleges/universities in Haryana. When people are selected for the study from the population of interest using different techniques, the selected people constitutes the sample which is assumed to represent the population. In the present study, the researcher used the quota sampling technique which is a non-probability sampling. In quota sampling, the researcher considered the various strata of population, and from each stratum, researcher selected the subjects arbitrarily.

“One form of non-probability sampling is quota sampling, in which knowledge of strata of the population - sex, race, religion and so on- is used to select sample members that are representative, typical and suitable for certain research purpose” (Kerlinger 1986). The inclusion criterion for sample selection is internet usage. The researcher considered the population strata; professional and non-professional courses. 550 students (UG & PG courses) studying in various colleges and universities of Haryana were selected based on the levels of independent variables.

Table 3.1: Sample Layout of the Study

Sr. No.	Name of Universities/Colleges/Institutes	Number of Sample Taken
1	Maharshi Dayanand University, Rohtak	63
2	Chaudhary Bansi Lal University, Bhiwani	48
3	Deenbandhu Chhotu Ram University of Science and Technology, Murthal, Sonipat	36
4	Indira Gandhi University, Meerpur, Rewari	43
5	ICFAI Business School (IBS), Gurugram	40
6	J. C. Bose University of Science and Technology, YMCA, Fridabad	30
7	BPSMV Regional Centre Lula Ahir, Rewari	57
8	Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar	38
9	BPSMV Regional Centre Kharal, Jind	30
10	Kurukshetra University, Kurukshetra	62
11	Central University of Haryana, Jant-Pali, Mahendergarh, Haryana	28
12	Chaudhary Devi Lal University, Sirsa	75

3.3 Variables of the Study

Variable is a key term for any type of research whether it is in social sciences, humanities, or physical science etc. In research work, variable should be clear. If it's not clear then it can create difficulty for the researcher. The variable plays main role in any research. Variable is defined as a characteristic of person, object and groups to whom a quantitative and qualitative value can be assigned.

This chapter discusses about the research method that the researcher is using in present study. This chapter also includes the variable of the study, sample size, tool to be used for data collection and statistical analysis.

3.3.1 Independent Variables

- (I) Levels of internet Addiction [three levels]
 - (a) Mild
 - (b) Moderate
 - (c) Severe
- (II) Type of course study [two levels]
 - (a) Professional courses, and
 - (b) Non-Professional.

3.3.2 Dependent Variables

- (i) Personality Five Factor (N, E, O, A, C), and
- (ii) Mental Health.

3.4 Tools Used

1. Internet addiction questionnaire constructed by researcher.
2. Positive Mental Health Inventory by Agashe and Helode (2008).
3. NEO-Five Factor Inventory (FFI) by Costa & McCrae (1992).

3.4.1 Test Construction

Test is a series of questions made by any psychologist, educationist, research scholars or investigator to seek demographical information regarding their research work. They use a standardized procedure to collect the quantitative or qualitative information pertaining to verbal or nonverbal behaviour of a person. Some test measures one aspect of behaviour or traits of a person and other tests measures more than one aspect of verbal and nonverbal behaviour of a subject. On the basis of performance there are two

types of test i.e. individual test and group test, the measurement may be either quantitative or qualitative.

Some diverse views on psychological tests:

- A test is “an organized succession of stimuli designed to measure quantitatively or to be evaluate qualitatively some mental process, traits or characteristics” (Bean, 1953).
- Psychological test is “essentially an objective and standardized measure of sample of behaviours” Anastasi and Urbina 1997).
- Kaplan and Saccuzzo (2001), have the opinion that “a psychological test or educational test is a set of items designed to measure characteristics of human beings that pertain to behaviour”.

3.4.2 General Steps of Test Construction

1. Planning
2. Item Writing
3. Preliminary administration
4. Establishing Reliability
5. Calculating Validity
6. Preparation of norms
7. Preparation of manual and Reproduction of the test

3.4.3 Internet Addiction Questionnaire Construction

Making of a questionnaire is the most tedious work to do. First thing that we need to do while making a questionnaire is to design situational judgments test (SJT) format. The

tests with SJT format are meant to evaluate one's judgment in specific situations. For example, an aptitude test evaluates one's natural skills or abilities.

The researcher prepared 40 situations in both Hindi and English language with 4 responses of each situation, two positive and two negative responses. After that, these situations were sent to 50 experts who are related to the same field. A copy of the test has been sent to DIPR (Defence Institute of Psychological Research, Delhi). All the valuable suggestions which were received were incorporated in the final questionnaire. Researcher selected 26 items out of 40, based on the expert's suggestions. These 26 items supported by 90% of experts for further research. The final copies were corrected by both Hindi and English Language experts for linguistic mistakes if there were any. All the 26 situations were retained successfully. Once the tests were ready, they were administered on students to find out the ground level difficulties. At last, once all the difficulties were taken care of, the test was finally ready for final study.

Table 3.2: Expert's Views on Internet Addiction Questionnaire Items

Question No.	Judges Scores	Percentage of Judges Scores	Question No.	Judges Scores	Percentage of Judges Scores
1	$\frac{45}{50} \times 100$	90	21	$\frac{48}{50} \times 100$	96
2	$\frac{46}{50} \times 100$	92	22	$\frac{47}{50} \times 100$	94
3	$\frac{44}{50} \times 100$	88	23	$\frac{44}{50} \times 100$	88
4	$\frac{41}{50} \times 100$	82	24	$\frac{44}{50} \times 100$	88
5	$\frac{38}{50} \times 100$	76	25	$\frac{45}{50} \times 100$	90
6	$\frac{34}{50} \times 100$	68	26	$\frac{49}{50} \times 100$	98

Question No.	Judges Scores	Percentage of Judges Scores	Question No.	Judges Scores	Percentage of Judges Scores
7	$\frac{47}{50} \times 100$	94	27	$\frac{48}{50} \times 100$	96
8	$\frac{48}{50} \times 100$	96	28	$\frac{42}{50} \times 100$	84
9	$\frac{49}{50} \times 100$	98	29	$\frac{46}{50} \times 100$	92
10	$\frac{38}{50} \times 100$	76	30	$\frac{46}{50} \times 100$	92
11	$\frac{37}{50} \times 100$	74	31	$\frac{48}{50} \times 100$	96
12	$\frac{46}{50} \times 100$	92	32	$\frac{47}{50} \times 100$	94
13	$\frac{44}{50} \times 100$	88	33	$\frac{47}{50} \times 100$	94
14	$\frac{47}{50} \times 100$	94	34	$\frac{46}{50} \times 100$	92
15	$\frac{41}{50} \times 100$	82	35	$\frac{44}{50} \times 100$	88
16	$\frac{46}{50} \times 100$	92	36	$\frac{47}{50} \times 100$	94
17	$\frac{30}{50} \times 100$	60	37	$\frac{46}{50} \times 100$	92
18	$\frac{48}{50} \times 100$	96	38	$\frac{48}{50} \times 100$	96
19	$\frac{44}{50} \times 100$	88	39	$\frac{45}{50} \times 100$	90
20	$\frac{46}{50} \times 100$	92	40	$\frac{48}{50} \times 100$	96

3.4.4 Reliability of the Test

Reliability means the precision and consistency in the measurements or scores of the test. A reliable psychological test measures accurate outputs at the present time as well as over a period of time. According to Anastasi & Urbina (1977, 1985) reliability refers

to “the consistency of the score obtained by the same individuals when re-examined with test on different occasions, or with different sets of equivalent items, or under other variable examining conditions.”

According to Marshal & Hales (1972), “The degree of consistency among test scores is called reliability.” There are four most common methods of estimating the reliability of any test. These methods are test-retest reliability, internal consistency reliability, parallel-form reliability and scorer reliability. A single test which is taken on the same sample after a reasonable time period is known as test-retest reliability. “Internal consistency reliability” refers to the “homogeneity” of the test. After a test, if all the items of a test show similar traits or functions then the test is called a homogeneous test it has high internal consistency reliability. Split half method is commonly used method for measuring the internal consistency reliability. In alternate form reliability test two forms comparable and equivalent forms are developed. Scorer reliability is the reliability which can be estimated by having a sample of test independently scored by two or more examiners. The sets of scores obtained by each examiner are completed in the usual way and the resulting correlation coefficient is known as scorer reliability. In Split-Half Method of Reliability, a test is divided in two equal parts. The general way of dividing is “odd-even method” and other one is dividing the form in two equal parts, first half and the second half of the items. First method is called odd-even method and second is first half versus second half method. In both methods odd-even method is popular among researchers. The product moment correlation is computed between first half and second half scores.

Table 3.3: Reliability of Internet Addiction Questionnaire

Total item	26
Test-Retest Reliability	0.78
Split-Half Reliability	0.79
Cronbach's Alpha	0.78
KR-20	0.80

The table 3.3 shows that split-half reliability of internet addiction test is 0.79. In split-half reliability all necessary data for the computation of the reliability coefficient are obtained in a single administration of test. Therefore, a quick estimate of the reliability is made. That's why; Guilford and Fruchter (1937) have described it as on-the-spot reliability.

3.4.5 Validity of the Test

The term 'validity' means fidelity or truth. Validity basically refers to the degree of measurement of any test. According to Anastasi (1996, 99) "the validity of a test concerns what the test measures and how well it does show". The present test contains content validity. While constructing a test, the content of its term measures what the whole test claims to. That sort of test has content or curricular validity. Content validity of any test is analysed in two ways: (i) based on the expert's judgments, and (ii) based on statistical analysis. In the present scale content validity is calculated by method of expert's judgment.

3.4.6 Percentile Norms of the Test

Table 3.4: Percentile Norms of Internet Addiction Questionnaire

Percentile	Score	Interpretation
68-100	13 and above	Severe
34-67	8-12	Moderate
0-33	0-7	Mild

The Table 3.4 shows that those participants who scored 13 and above indicate severe internet addiction, and the participants who scored between 8 to 12 indicate moderate internet addiction. Whereas, the participants who scored between 0 to 7 indicate mild internet addiction.

3.4.7 Scoring Procedure of the Internet Addiction Questionnaire

Scoring of Internet Addiction Questionnaire is simple. This test contains 26 statements followed by four situations where two are positive and other two are negative. The respondent has to choose any one situation out of given four statements. One mark for negative response and zero marks for positive response.

Table 3.5: Scoring Key of Internet Addiction Questionnaire

Sr. No.	Four alternatives	Score	Sr. No.	Four alternatives	Score
1	A	1	14	A	1
	B	0		B	0
	C	0		C	0
	D	1		D	1
2	A	1	15	A	0
	B	0		B	1
	C	0		C	0
	D	1		D	1
3	A	0	16	A	1
	B	0		B	1
	C	1		C	0
	D	1		D	0
4	A	1	17	A	0
	B	1		B	0
	C	0		C	1
	D	0		D	1
5	A	0	18	A	1
	B	1		B	0
	C	0		C	1
	D	1		D	0

Sr. No.	Four alternatives	Score	Sr. No.	Four alternatives	Score
6	A	1	19	A	1
	B	0		B	0
	C	1		C	0
	D	0		D	1
7	A	1	20	A	0
	B	0		B	1
	C	1		C	1
	D	0		D	0
8	A	1	21	A	1
	B	0		B	0
	C	0		C	0
	D	1		D	1
9	A	1	22	A	1
	B	1		B	0
	C	0		C	0
	D	0		D	1
10	A	1	23	A	1
	B	1		B	0
	C	0		C	0
	D	0		D	1
11	A	1	24	A	1
	B	0		B	1
	C	1		C	0
	D	0		D	0
12	A	1	25	A	1
	B	1		B	1
	C	0		C	0
	D	0		D	0
13	A	1	26	A	1
	B	0		B	1
	C	1		C	0
	D	0		D	0

3.5 Positive Mental Health Inventory by Agashe and Helode (2008)

The tripartite model of Strupp and Hadley (1977) is used as a base for constructing positive mental health inventory in Hindi. First, preliminary draft encompassed of

48 items was constructed by the researcher. Out of these, 16 items were to tap the component of self-acceptance, 16 items for measuring ego-strength and remaining 16 were for taping the component of philosophy of human nature. After that, these items were sent to the psychologist related to same field. Later, it was subjected to item analysis. For Item analysis, sample of 370 students from Pandit Ravi Shankar Shukla University, Raipur were selected. After item analysis, 36 valid items were retained by the researcher. Out of these, 12 items measured self-acceptance, 12 ego strength, and the remaining 12 items philosophies of human nature. The component-wise items along with the item-wise coefficients of bi-serial are displayed in Table 3.6.

Table 3.6: Component-wise Items with Validity Coefficients

(1) Self-acceptance		(2) Ego-strength		(3) Philosophies of life	
Item No.	Coefficient	Item No.	Coefficient	Item No.	Coefficient
2	0.64	1	0.85	3	0.35
4	0.35	6	0.38	5	0.22
10	0.49	7	0.39	12	0.33
11	0.40	8	0.38	13	0.60
20	0.49	9	0.35	19	0.53
22	0.40	14	0.59	21	0.38
24	0.39	15	0.37	23	0.20
26	0.53	16	0.68	25	0.59
28	0.60	17	0.32	30	0.28
29	0.22	18	0.48	32	0.34
31	0.48	27	0.60	35	0.40
34	0.60	33	0.39	36	0.68

3.5.1 Instructions and Administration Procedure of the Inventory

Positive mental health inventory can be applied in group of maximum 30 subjects or can be administered individually. Subjects should be sufficiently motivated to take the test. The necessary instructions are printed on the first page of the inventory. Individual have to read each statement carefully and is required to answer the statement in true and false format. Individuals have to put a right tick mark (\checkmark) in the bracket given in front of the statement, if they find it as a true statement. If individuals find the statement false, they have to put a cross mark (x) in the bracket given in front of the statement.

3.5.2 Scoring Procedure of Mental Health Inventory

Numerical credit of one mark was given to each response that matches with the keyed answer, and a numerical credit of zero mark was given to the response which does not match with the keyed answer. A composite score on the whole inventory serves as an individual's raw score. The maximum score is 36 and minimum is zero. Higher score indicates high degree of positive mental health and vice versa. The item wise keyed answers of the inventory are displayed in Table 3.7.

Table 3.7: Item-wise Keyed Answers

Item No.	Keyed Ans.	Item No.	Keyed Ans.	Item No.	Keyed Ans.	Item No.	Keyed Ans.
1	×	10	×	19	\checkmark	28	×
2	×	11	\checkmark	20	×	29	×
3	\checkmark	12	\checkmark	21	×	30	\checkmark
4	\checkmark	13	×	22	\checkmark	31	×
5	×	14	\checkmark	23	\checkmark	32	\checkmark
6	\checkmark	15	×	24	\checkmark	33	\checkmark
7	×	16	\checkmark	25	×	34	\checkmark
8	\checkmark	17	×	26	\checkmark	35	×
9	×	18	×	27	\checkmark	36	×

3.5.3 Reliability of the Mental Health Inventory

The test-retest reliability of Positive Mental Health Inventory was conducted on the sample of 100 University students having equal number of boys and girls. The test-retest reliability worked out with Pearson method and time interval between administrations of both forms was 15 days. The obtained test-retest reliability coefficient turned out to be 0.723 which is significant at $p < .01$, which denotes high level of reliability through stability indices.

3.5.4 Validity of the Mental Health Inventory

For the validity of Positive Mental Health Inventory, 36 internally valid items along with Eysenck and Eysenck's (1976) N scale of PEN inventory was administered to 308 college/ university students, that yielded correlation of -0.427 (significant at $p < .01$). It indicates that this inventory has significant construct validity.

Sharma and Yadava (2001) studied mental health of full time working (40), part time working (40), and house-wives (40), total 120 women by administering this inventory and found that the moderate job stressed women (i.e. part time working) were significantly different as well as of better mental health than the height of stress (i.e. full time working) and the no job stress (i.e. house-wives) - the other two groups. Thus, it can be said that this inventory stands with statistically significant "concurrent" validity too.

3.6 The Revised NEO Personality Inventory

It is a psychometric assessment tool and used for personality assessment. It is also known as the big five personality test. It assesses the five following personality dimensions which comprised of 6 characteristics each: -

- (i) **Neuroticism** – “Anxiety, Hostility, Depression, Self-consciousness, Impulsiveness Vulnerability to stress.”
- (ii) **Extraversion** – “Warmth, Gregariousness, Assertiveness, Activity, Excitement-seeking, Positive emotion.”
- (iii) **Openness to experience** – “Fantasy, Aesthetics, Feelings, Actions, Idea, Values.
- (iv) **Agreeableness** – Trust, Straightforwardness, Altruism, Compliance, Modesty, Tender mindedness.”
- (v) **Conscientiousness** – “Competency, Order, Dutifulness, Achievement striving, Self-discipline, Deliberation.”

The short version of “NEO Five Factor Inventory” (FFI) consists of 60 items covering five factors of an individual’s personality. It has 12 items for each factor or model. The item wise distribution in the inventory is showed in Table 3.8 and the perceived responses are displayed in Table 3.9.

Table 3.8: Item Wise Distribution in NEO-FFI

Dimensions	Item No.
“Neuroticism”	“1*,6,11,16*,21,26,31*,36,41,46*,51,56”
“Extraversion”	“2,7,12*,17,22,27*,32,37,42*,47,52,57*”
“Openness”	“3*,8*, 13,18*,23*,28,33,38*,43,48*,53,58”
“Agreeableness”	“4,9*,14*,19,24*,29*,34,39*,44*,49,54*,59*”
“Conscientiousness”	“5,10,15*,20,25,30*,35,40,45*,50,55*,60”

*Negative statements

The subject needs to respond to each statement through a five points scale from strongly agree to strongly disagree.

Table 3.9: Perceived Responses in NEO-FFI

SD	“Strongly Disagree”
D	“Disagree”
N	“Neutral”
A	“Agree”
SA	“Strongly Agree”

3.6.1 Reliability of NEO-FFI

The reliability coefficients of NEO-FFI are 0.76, 0.90, 0.78, 0.86 and 0.90 for the dimensions of openness, neuroticism, extraversion, agreeableness and conscientiousness, respectively.

3.6.2 Validity of NEO-FFI

The coefficient of correlation of NEO-FFI with NEO PI-R domain (Single peer rating) are displayed in Table 3.10.

Table 3.10: Correlations of NEO-FFI with Validity Criteria NEO-PI-R Domains, Single Peer Ratings

Criterion	NEO-FFI From S Scales				
	N	E	O	A	C
“Neuroticism”	0.36**	-0.03	0.01	-0.15	-0.07
“Extraversion”	-0.05	0.39**	0.17**	-0.01	0.00
“Openness”	0.10	0.11	0.48**	0.00	-0.12
“Agreeableness”	-0.07	-0.19**	-0.02	0.40**	-0.14*
“Conscientiousness”	-0.15*	-0.06	-0.02	0.09	0.33**

*p < 0.05; **p < 0.01.

The coefficients of correlation reflect a significant and positive relationship between two measures, thereby gives evidence of both convergent and discriminate validity.

3.6.3 Interpretation of the NEO-FFI Score

The developer of NEO-FFI had administered the test on a large sample of youths of all ages in the United States and developed norms for the inventory.

Table 3.11: Norms for NEO-FFI

Category	Score	Interpretation
Neuroticism	Below 6	Very Low
	Below 13	Low
	Above 21	High
	Above 29	Very High
Extraversion	Below 18	Very Low
	Below 23	Low
	Above 30	High
	Above 36	Very High
Openness	Below 18	Very Low
	Below 23	Low
	Above 30	High
	Above 36	Very High
Agreeableness	Below 24	Very Low
	Below 29	Low
	Above 35	High
	Above 40	Very High
Conscientiousness	Below 25	Very Low
	Below 30	Low
	Above 37	High
	Above 43	Very High

3.7 Procedure

For data collection, the researcher selected various institutions and universities situated in Haryana state only. Students, both boys and girls enrolled in professional and non-professional courses were selected for present research work. The students were from 18-25 years old. After the selection of institutions or universities/colleges, the researcher requested to the Head of institutions and concerned departments for data collection.

Before distribution of the tests, the investigator established a rapport with all the participants. Selected sample was administered with self-made Internet Addiction Questionnaire, Positive Mental Health Inventory by Agashe and Helode (2008) and NEO “Five Factor Personality Inventory” by McCrae and Costa (1992) along with Demographic Information Checklist for Internet Users. The researcher explained all the instructions regarding the questionnaires. After completion of the task, researcher collected all tests/checklist from the participants with warm thanks. He checked each answer booklet for its completion.

3.8 Ethical Considerations

This study was conducted after the approval in the minutes of meeting of DRC of School of Education/Department of Education, Central University of Haryana (Jant-Pali), Mahendragarh. The researcher strictly adhered to all the 6 ethical principles (*Deception, Informed Consent, Anonymity, Coercion, Risk and Debriefing Procedures*) laid down by the APA. The consent of the Head of the Dept. was taken in a telephonic conversation for data collection. All the students were told about the aim of the research.

All the students were made aware of their right to refuse or participate in the study. The study was purely on volunteer basis. If they feel uncomfortable at any time of study, they were free to leave without even intimation to the researcher. As this study was noninterventionist, therefore, no physical and mental harm was caused to the participants. Most of the participants were bilingual and remaining ones were Hindi speakers, so they were instructed in both Hindi and English. All the doubts raised by participants were cleared at the spot. The participants were not given any types of

incentives whether cash or kind. In fact, in the role reversal, researcher was bestowed with fine hospitality by the participants. Some of the participants, who desired to know their results, were informed of their results.