MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY
DEPARTMENT OF MANAGEMENT

Report
on
One-Week Faculty Development Program
on
"Basic and Advanced Research Techniques: A PLS-SEM Approach"
(3-7 JULY, 2023)

Resource Persons:

Dr Puja Khatri, Professor
USMS, GGSIP University, Delhi

Dr. Neeraj Kaushik, Associate Professor & HOD
Dept of Business Administration, National Institute of Technology, Kurukshetra

and

Dr. Simarjeet Singh, Assistant Professor
Great Lakes Institute of Management, Gurgaon

Convener: Dr. Amit Gupta, HOD - Dept. of Management

Coordinators: Dr. Anoop Kumar Gupta, Dr. Sanjeev Kumar and Dr. Sukhvinder Singh

Co-Coordinators: Dr. Nitin Walia, Mr. Nishant Gaur and Ms. Neha Sharma

MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY
(Approved by AICTE and Affiliated to GGSIP University, Delhi)

Department of Management

ONE-WEEK
FACULTY DEVELOPMENT PROGRAM
ON
**"BASIC AND ADVANCED RESEARCH TECHNIQUES :
A PLS-SEM APPROACH"**
3-7 July, 2023

DR. NAND KISHORE GARG	SHRI VINEET KUMAR LOHIA	SHRI S.P. AGARWAL (IAS)
Founder & Chief Advisor	Chairman	Executive Chairman
MATES	MATES	MATES

PROF. (DR) NEELAM SHARMA	PROF. (DR) S.S. DESWAL	PROF. (DR) AMIT GUPTA
Director	Dean	Convener & Head
MAIT	MAIT	Dept. of Management, MAIT

Coordinators

Dr. Anoop Kumar Gupta	Dr. Sanjeev Kumar	Dr. Sukhvinder Singh	Education Partner

Co-coordinators

Dr. Nitin Walia	Mr. Nishant Gaur	Ms. Neha Sharma

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Topic: Basic and Advanced Research Techniques: A PLS-SEM Approach

Venue: Room No 741, Block 7, MAIT Campus

Coordinators: Dr Anoop Kumar Gupta, Dr Sanjeev Kumar & Dr Sukhvinder Singh

Co-coordinators: Dr Nitin Walia, Mr Nishant Gaur, Ms Neha Sharma

The Department of Management, MAIT organized a One-week offline Faculty Development Program (FDP) on the topic of "Basic and Advanced Research Techniques: A PLS-SEM Approach" from 3rd to 7th July 2023. The resource persons were Dr. Puja Khatri, Professor, USMS, GGSIP University, Delhi; Dr Neeraj Kaushik, Associate Professor and HOD, Department of Business Administration, National Institute of Technology, Kurukshetra; and Dr Simarjeet Singh, Assistant Professor, Great Lakes Institute of Management, Gurgaon. The group of participants included Faculty members and Research Scholarsfrom various prominent Universities and Institutions of Delhi/NCR and North and Central India.

INAUGURATION OF THE FDP:

The FDP commenced with an inaugural program that started with a brief introduction about the Institute given by Dr Sukhvinder Singh, FDP Coordinator. It followed up with Saraswati Vandanaand lighting of the lamp by the dignitaries. Then the theme of the FDP program was introduced to the dignitaries and participants by the FDP Coordinator Dr. Anoop Kumar Gupta. The welcomespeech was given by the Director, MAIT, Prof. (Dr.) Neelam Sharma. This was followed by an enlightening speech by Shri S.P. Agarwal (IAS), Executive Chairman, MATES. The Dignitaries were welcomed by presenting saplings to them. Thereafter, Dr Sanjeev Kumar, FDP Coordinator introduced the first resource person, Dr Puja Khatri to the audience.

The inaugural session concluded with a vote of thanks by Prof. (Dr.) Amit Gupta, HOD, MAIT. A total of over 55 external participants were present in the inaugural session. The Inaugural sessionwas followed by High Tea.

Day 1 – 3 July, 2023 – Session 1

It started at 9:30 am. Dr. Puja Khatri started the session on Scale Development in Research with very innovative examples as to how it is vital for meaningful data collection under various situations.

The following topics were covered in Session 1:
- Introduction to Scale development in research – Concept, Constructs and Items
- How to develop scales for different research questions
- Different types of Scales being used in HR/OB research areas

Practical examples were discussed with a step-by-step approach. Participants learnt the concepts very well. It was followed by the lunch break.

Day 1 – 3 July, 2023 – Session 2

Session started at 2.30 pm. Dr Puja Khatri started the session with very innovative examples to summarize the first session. The following topics were covered in Session 2:

- Difference between Reflective and Formative Constructs
- Basic representation of these constructs in PLS-SEM software
- Steps in developing a Questionnaire and checking its validity and reliability

Participants learnt the concepts very well and practiced on their laptops.

Day 2 – 4 July, 2023 – Session 1

The session started at 9.00 a.m. Dr Neeraj Kaushik started the session on Basic Research fundamentals using the difference between Regression and Correlation using the life related examples in our personal lives.

The following topics were covered in Session 1:

- How to identify variables from the Objectives?
- Decision on Measurement scales
- Role of Variable – Dependent and Independent, Moderating and Mediating Variables, Marker Variables and Control Variables
- What do the researcher want to do with the identified variables?

Practical examples were discussed with a step-by-step approach. Participants learnt the concepts very well. It was followed by a 15-minute tea-break.

Day 2 – 4 July, 2023 – Session 2

It started on 11.45 am. Dr Neeraj Kaushik continued the session on Basic research process and other steps needed to deal with different types of research variables. He discussed various research methods and the data analysis techniques that should be used for analyzing the data collected. He explained the basis of selection of the analytical techniques, and how the selection is affected by the type of measurement scale used in the data collection instrument. The selection of techniques was based on the nature of Dependent and Independent variables i.e., whether they were collected through nominal, ordinal, interval or ratio measurement scales.

Participants learnt the concepts and practiced on their laptops. It was followed by Lunch break.

Day 2 – 4 July, 2023 – Session 3

It started on 2.15 pm. Dr Neeraj Kaushik continued the session on Regression and correlation concepts with practical examples from our daily lives. In particular, the following topics were covered by him:

- Simple Regression Model – significance of r and r-square using SPSS hands-on exercises
- Multi-collinearity between IDVs in detail and how to identify significant variables after identifying multi-collinearity using regression

- Concept of Normality and how it matters in research situations
- Basic Introduction to checking Validity and Reliability of Constructs and its scope
- Need for CFA and EFA and their use and relevance in PLS-SEM software

The session was followed by the Tea before the conclusion of the day.

Day 3 – 5 July, 2023 – Session 1

It started at 9.00 am. Dr Neeraj Kaushik covered how to make the Conceptual Model using the ISM / TISM approach.

He further provided a systematic, evidence-based guide to the formation of the Meta analysis model using Meta Essentials. Model Building Rules were discussed and detail and demonstrated to the researchers, which can be followed by researchers with modest statistical training.

He demonstrated various functions using SMART-ISM package and supplemented it with practical examples to show it on screen with hands-on exercises.

Practical exercises were discussed with a step-by-step approach. Session was followed by a tea-break.

Day 3 – 5 July, 2023 – Session 2

It started on 11.30 am – Dr Neeraj Kaushik started this session by covering the following topics in detail:
Establishing Construct Validity:
- Face validity – checking language/ grammar
- Content validity – checking validity of dimensions

For Reflective and Formative constructs, the following two types of validity were discussed:
- Convergent Validity
- Discriminant Validity
- Nomological Validity

These concepts were demonstrated through SMART-PLS software, which is based on partial least square based structural equation modelling. The session was followed by lunch-break.

Day 3 – 5 July, 2023 – Session 3

It started on 2 pm – Dr Neeraj Kaushik started this session by continuing to cover different functions of SMART-PLS software. The following concepts were discussed in depth:

- Structural Modelling using CFA and EFA
- Factor Loadings and Weights in Reflective and Formative Constructs respectively
- Interpretation of results for CFA and EFA analysis
- Model Improvement features in SMART PLS

Participants practiced the exercises on their laptops. It was followed by the Tea break before the day was called off.

Day 4 – 6 July, 2023 – Session 1

It started at 9.00 am. Dr Neeraj Kaushik continued on the concepts he discussed on Day 3 on Mediation and Moderation. He specifically covered the steps related to:

- Mediation – Total Effect, broken down into Direct and Indirect effects
- Partial Mediation
- Bootstrapping

Practical examples were discussed with datafiles using a step-by-step approach. It was followed by a tea-break.

Day 4 – 6 July, 2023 – Session 2

It started on 11.30 a.m. – Dr Neeraj Kaushik started this session by covering a full comprehensive presentation on Mediation and Moderation Approaches and Flowcharts. He focused on Moderation approaches in detail with Metric and Non-metric data types. Practical exercises on both types of moderation variables were done and participants learnt a lot from this session.
It was followed by lunch break.

Day 4 – 6 July, 2023 – Session 3

It started on 2 pm – Dr Neeraj Kaushik started this session by continuing to revise and further cover the various items under Mediation and Moderation. The following concepts were specifically covered:

- Control Variables
- Higher Order Constructs
- Lower Order Constructs

Detailed steps were discussed for both Higher Order and Lower Order Constructs using SMART- PLS software, including the interpretation of results.

Participants practiced the exercises on their laptops. It was followed by the Tea break before the day was called off.

Day 5 – 7 July, 2023 – Session 1

It started at 9.30 am. Dr Simarjeet Singh started the day with a session on "Art of Literature Review". He covered the following types of literature review:
- Domain based review
- Theory based review
- Method based review
- Meta-analytical review
- Different Frameworks – 5W+1H, TCCM, ADO and IMO frameworks

Practical examples were discussed with a review of papers online. Participants learnt the concepts very well. It was followed by a tea-break.

Day 5 – 7 July, 2023 – Session 2

It started on 11.30 am – Dr Simarjeet Singh started this session with focus on concept of "Bibliometric Review". This type of review is relevant only when number of papers are quite large, e.g., over 200 papers. He covered the following specific tools:
- Citespace
- Scimat
- Performance mapping and Network mapping
- Qualitative studies
- Multi-vocal literature review

It was followed by lunch break.

Day 5 – 7 July, 2023 – Session 3

It started on 2.15 pm – Dr Simarjeet Singh started the session by continuing to cover Bibliometric Analysis in detail with focus on hands-on demonstration of features of Biblioshiny tool. He covered the following features in Biblioshiny tool:

- Import file into Biblioshiny
- Performance mapping and Network mapping
- Quantity and Quality parameters
- Citation Analysis and ratio between local citation to total citations
- Page rank Analysis
- Clustering analysis
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In the end, he discussed some critical aspects of paper writing which are often neglected by researchers and leads to rejections by good journals.

This was followed by a brief valedictory session.

Ms Neha Sharma welcomed the dignatories to the valedictory session. Participation certificates were distributed by the **Director MAIT Prof. (Dr.) Neelam Sharma, Dean Academics Prof. (Dr.) S.S. Deswal and HOD Prof. (Dr.) Amit Gupta** to various participants who attended the FDP. The session ended with feedback from some of the participants. Overall, it was a good learning experience for the participants.