LECTURE 35:Academic Integrity & Ethical Guidelines in Science Communication

 Dear learners, welcome to this NPTEL course on Science Communication Research Productivity and Data Analytics using Open Source Software. I am Dr. Neeraj Chaurasia from Central Library, IIT, Delhi. The topic for today's lecture is academic integrity and ethical guidelines in science communication ensuring credibility and honesty. So, this would be the outline of my today's lecture. In this talk, I will try to cover various aspects related to academic integrity and ethical guidelines in science communication which includes an overview of academic integrity, academic integrity in science communication, why academic integrity is important in science communication, some of the broad categories of improper behaviour or academic misconduct in academic and research, what is academic misconduct and various types of academic misconduct we will also try to cover.

 I will also cover plagiarism in science communication in detail, some of the examples of academic misconduct, policies, procedures and guidelines on academic misconduct and ethics in research. I will also discuss about some of the general guidelines related to promote ethical conduct in science communication, the reasons for committing academic misconduct and some of the strategies to ensure and promote academic integrity in science communication, how to avoid plagiarism, finally the role of library in upholding academic integrity and preventing misconduct. So, scientific research involves the cooperation and coordination of different people to achieve goals that have impact on society and are essential for overall development in all the areas. As we all know that the research requires experimentation, data analysis, writing research papers, grant proposals and educating future scientists.

 So, it is essential that research is carried out in a way that are ethically correct. When we talk about academic integrity, it is a fundamental aspect of science communication that ensures honesty, trustworthiness and reliability in dissemination of scientific knowledge. Maintaining academic integrity in science communication is crucial for building and sustaining the credibility of scientific research. It involves upholding ethical standards and ensuring honesty, transparency and fairness in the process of production and dissemination of research findings. Academic integrity can be considered a form of social contract among academic community members.

 Thus, it occupies a prominent position in any research projects. However, there has not been so far a standard definition for this term on which a student or researchers can rely. Consequently, how to handle or cope with violations of academic integrity has become more complex. Now, what is academic integrity? Academic integrity is a broad term that includes research integrity and research ethics as well as appropriate behaviour in non-research settings such as avoiding plagiarism, cheating and copyright infringement. It is a set of ethical principles that members of an academic community follow.

 It means being honest and taking responsibility for academic work. Some of the examples

of academic integrity include avoiding plagiarism, properly citing the sources, not cheating or engaging in academic dishonesty, submitting original work, maintaining academic standards, honesty and rigour in research and academic publishing. So, these are some of the examples of academic integrity. Now let's discuss some of the fundamental principles of academic integrity. According to International Centre for Academic Integrity, ICAI, academic integrity is a commitment to six fundamental values which are honesty, trust, fairness, respect, responsibility and courage.

So, I would say that these are the six pillars of academic integrity. When we talk about academic integrity in science communication, academic integrity is a fundamental aspect of science communication that ensures honesty, trustworthiness and reliability in the dissemination of scientific knowledge. Here, I would like to highlight some of the key principles and considerations related to academic integrity in science communication. So, these are honesty and transparency. One needs to present research findings accurately and truthfully without manipulation or misrepresentation.

Clearly disclose any conflicts of interest that may influence the research or its interpretation. Second one is citation and attribution. One need to give proper credit to the original sources of information by citing them appropriately in your work. Avoid plagiarism by accurately paraphrasing and quoting sources and provide proper citations for all borrowed information. Third one is data integrity.

Insert the accuracy and reliability of data presented in the scientific communications. Clearly state the methods used to collect and analyse data, allowing others to replicate the research. So, this is how this data integrity is also a very important principle. Other one is peer review. One has to submit research work to peer reviewed journals to undergo a rigorous evaluation process by experts in the field.

Engage in constructive peer review when assessing the work of others contributing to the improvement of scientific knowledge. So, this is how peer review is very important. Other one is authorship and contributorship. Clearly define authorship criteria and acknowledge the contributions of all individuals involved in the research. Also avoid already authorship and ensure that all listed authors have made substantial contributions to the study.

So, these are the five important key principles and consideration related to academic integrity in science communication which all are very, very important. Now, why academic integrity is important? Academic integrity is important because it affects the entire academic community. It is the act of being honest, fair, respectful and responsible in your studies and academic work. Academic integrity is built on the principle of fairness, honesty, trust, respect, responsibility and courage as we have already discussed. Maintaining research integrity is a critical ethical consideration in academic writing.

Now, let us discuss about the academic misconduct. What is academic misconduct?

Research misconduct or scientific misconduct refers to actions and behaviours by researchers that fails to honour the integrity of research. Research misconduct is defined as the falsification, fabrication or plagiarism in conducting, planning, reporting or reviewing the research. Simply put, research misconduct is any intentional deviation from ethical research practices. Let us talk about the broad categories of improper behaviour or academic misconduct in academics and research.

There are different types of research misconduct or scientific misconduct and unethical practices in research. Some of the most common types of academic misconduct are fabrication, falsification, plagiarism, authorship, conflict of interest, cheating, approvals. Some of these research misconducts have been explained here. Like first one is fabrication. Fabrication is the intentional act of making up data or results and recording or reporting them.

This refers to the practice of making up data without having done the required research. Research misconduct covers not only the act of fabrication but also the sharing, discussing or publishing of this fabricated data or result. For example, in the social sciences a researcher completing a questionnaire for a fictitious subject that was never interviewed or the practice of adding fictitious data to a real data set collected during an actual experiment. Similarly in the biological sciences the creation of data sets for an experiment that was never actually conducted is also one of the examples of fabrication. So these are some of the examples of fabrication which comes under academic misconduct.

Next one is falsification. This type of scientific misconduct involves the wilful manipulation of data, materials, processes or equipments to arrive at predefined conclusions. So in other words, falsification is the manipulation of research materials or equipments or process or changing or omitting or suppressing of data or result without scientific or statistical justification and so on. So alteration of data or falsification of dates and experimental procedures, misinterpretation of results from statistical analysis, misrepresentation of methods of experiment such as the model used to conduct the experiment, all these are the examples of falsification. Now let's discuss one of the important academic misconduct that is plagiarism.

This is one of the most common type of scientific misconduct and involves using another person's ideas, content, writings, practices or results and passing them off as your own without giving due credit. Placism is a critical ethical issue in academic writing and it can lead to severe consequences such as loss of credibility and legal actions and so on. Other one is authorship. This type of scientific misconduct in research include attempts to assign false authorship without adequate contribution to research. Mentioning authors without their consent or failing to include authors who are original contributors, naming authors in the wrong order or incorrectly is also considered unethical.

So this comes under this. Conflict of interest is another kind of academic misconduct. This

can be classified under general scientific misconduct and this involves lapses by researchers in declaring any conflict of interest in their research work. These conflicts of interest may be financial, personal and professional and need to be reported appropriately to avoid unethical issues. Conflict of interest is not restricted to personal or financial gain. It extends to a large gamut of professional academic activities which includes peer review, serving on various committees etc.

Cheating is another form of unacceptable academic behaviour and may be classified into different categories. For example, copying during exam, copying of homework assignments, term papers or manuscripts, allowing or facilitating copying or writing a report or exam for someone else. Also using unauthorised material, copying, collaborating when not authorised and purchasing or borrowing papers or materials from various sources. Fabricating means making up or falsifying means manipulating the data and reporting them in thesis and publications. All these are the example of cheating.

Now next type of academic misconduct is approvals. One of the most important aspects of research that involves human or animal subject is adhering to all the ethical approvals and legal guidelines. Non-compliance with this ethical mandate is considered a serious type of research misconduct. Now let's talk about the plagiarism in research in detail. As discussed, plagiarism is specifically defined as a form of research misconduct.

Misconduct means fabrication, falsification, plagiarism or any other practice that seriously deviates from practices commonly accepted in the discipline or in the academic and research communities generally in proposing, performing, reviewing or reporting research and creative activities. So this is how this plagiarism is defined. This can apply to anything from term papers to photographs to songs, even ideas also. For example, submit a paper or dissertation or thesis to be graded or reviewed that you have not written on your own. Copy answers or text from another classmates and submit it as your own.

Quote or paraphrase from another paper without crediting the original author. Cite data without crediting the original source. Propose another author's idea as if it were your own. Fabricating references or using incorrect references. Submitting someone else's presentation, program, spreadsheet or other file with only minor alteration.

All these comes under the plagiarism. Also buying or selling term papers or assignments or dissertation or thesis, all these and similar kind of acts comes under plagiarism. This also includes self-plasurism which occurs when you replicate your own writings or ideas from previously published research without providing proper credit. Copying material. You have previously produced and passing it off as a new production.

So this self-plasurism also comes under the plagiarism. Plasurism in science communication is considered a serious ethical violation. Science relies on principles of honesty, transparency and proper attribution of ideas and information as we have already

discussed. Plasurism undermines these principles and can have significant consequences for both individual researchers and the scientific community as a whole. While science communication generally upholds the principles of honesty and integrity, there have been instances where academic integrity issues have arisen.

 Most scientists and researchers are there to ethical principles but these kind of instances serve as cautionary tales within the scientific community. So let's discuss about the policies, procedures or guidelines from various agencies on academic misconduct, research ethics and academic integrity in research practices. Research ethics are the set of rules that govern our expectations of our own and others' behaviour. Research ethics is the set of ethical guidelines that guide us on how scientific research should be conducted and disseminated. Research ethics govern and standard of conduct for scientific researchers.

 It is the guideline for responsibly conducting the research. In various institutions or universities, the research ethics committee or institutional review board and some of the other committees are constituted which reviews whether the research is ethical or not to protect the rights, dignity and welfare of the respondents. Guidelines for research ethics need to be laid down in such a way that concerns of research institutions and individuals are simultaneously addressed. Also it is important to these ethical guidelines in order to preserve the dignity, rights and welfare of researchers. Let's discuss some of the UGC regulations and guidelines that the UGC is the controlling body and has developed certain regulations, policies, procedures and guidelines related to research and publication ethics to uphold the academic integrity.

 I would like to mention here some of these UGC regulations and guidelines. First one is the UGC regulations on minimum standards and procedures for the award of Amphil PhD degree regulations 2009. It was developed by UGC under that. It was mandatory to submit a e-copy of thesis to Sodganga. Another important landmark was enactment of UGC regulations referred as promotion of academic integrity and prevention of plagiarism in higher education institutions regulations 2018.

 These guidelines necessitated that the university undertakes steps essential to enforce the academic integrity in the academic work being done in the university or institution. UGC launched UGC care list of quality reference journals in the year 2019. UGC has taken a firm step to improve quality of research and safeguard publication ethics for this purpose. The UGC has established consortium for academic and research ethics that is also known as CARE for creation and maintenance of reference list of quality journals in the year 2019. So this is also one of the important landmarks in this direction.

 Fourth important thing was in December 2019 a two credit course on research and publication ethics was introduced and this was one of the important aspects in this direction and this is the mandatory course for all the PhD awarding institutions. Another important regulation or guidelines from UGC was the clarification on self plagiarism in

2019. Another guidance document good academic research practice was prepared in the September 2020. So these all are very important regulations or guidelines from UGC and I will request all the learners please go through all these documents if you have not already gone. So here BLIS professionals can play an important role to train the researchers about the academic integrity, about plagiarism, how to detect and avoid plagiarism, research ethics and so on.

Miss conducting science communication can undermine the integrity of scientific research and hinder the public's trust in scientific information. Here are some of the general guidelines to promote ethical conduct in science communication which includes accuracy and truthfulness. So communicate information accurately and truthfully. Clearly distinguish between the established facts, hypothesis and personal opinion. Peer review and citations is also one of the important guidelines in terms of promotion of ethical conduct in science communication which include base your communication on peer reviewed and reputable sources.

Clearly attribute information to its original sources and provide proper citations, acknowledge uncertainties and limitations in the research. Other important guideline is conflict of interest. So one should always disclose any potential conflicts of interest that may affect your objectivity. Be transparent about funding sources and affiliations.

Also respect for the privacy. Respect the privacy and confidentiality of individuals involved in the research. Obtain informed consent before sharing personal stories or information. So this respect of privacy is very very important. Other important guideline is avoiding plagiarism. So for this always give proper credit to the original author when using their work or ideas.

Do not present someone else's work as your own. Clear communication is also one of the important guidelines for promoting the ethical conduct in science communication which includes use clear and accessible language that is understandable to broad audience. Avoid jargon or technical language when communicating with non-experts. Balance and fairness is also one of the important guidelines. One should present a balanced view of scientific controversies. Acknowledge alternative viewpoints and uncertainties without bias.

Engage with the public. So for this foster open and honest communication with the public. Respond to questions and criticism in a respectful manner. Also the social responsibility. One should also consider the potential societal impact of your communication.

Be aware of cultural and social contact. Be aware of cultural and social context that may influence the interpretation of your message. So social responsibility is also very important guideline. Continuous learning which is again very important aspect of this ethical conduct. Stay informed about new development in your field. Update your communication if new evidence emerge that contradict previous information.

So always try to update your communication. Professional integrity is also very important. Uphold professional standards of integrity and honesty in all the communication activities. Report any misconduct you observe within the scientific community. So this is how this professional integrity is very important. Please remember that these guidelines are not exhaustive and ethical consideration may vary in different context.

Basically scientist and science communicators should be committed to maintaining the highest standards of integrity and promoting the culture of transparency and accountability in science communication. If academic and research misconduct reported there may be penalties as per the level of misconduct. As per the UGC regulations, promotion of academic integrity and prevention of plagiarism in research in higher educational institutions regulations 2018. This regulation graded plagiarism into four levels based on the amount of similarity quantified through plagiarism detection software. As per the UGC promotion of academic integrity and prevention of plagiarism in higher educational institutions regulations 2018.

This regulation grades plagiarism into four levels based on the amount of similarity quantified through plagiarism detection software. So plagiarism label zero that is similarities up to 10 percent so this attracts no penalty. When we talk about the level one plagiarism when the similarities are between 10 percent to 40 percent the students would be asked to resubmit the revised script of their thesis within a stipulated time not exceeding six months. If the document is academic or research publications the author would be asked to withdraw the manuscript. So this is how label one plagiarism is defined in this regulation 2018.

Label two plagiarism under that it is prescribed that label two plagiarism is from 40 to 60 percent is devouring the student from submission for one year. Label two plagiarism in publication will lead to the loss of one annual increment and such faculty will not be allowed to supervise research scholars for two years in addition to withdrawal of said manuscript. Let's talk about label three plagiarism when similarities are over 60 percent such students' registrations for the program would be cancelled and in the case of research papers the faculty will be denied two successive annual increments and they are denied the opportunity to guide the research scholars for three years. The repeated instances of plagiarism by an individual would attract a higher penalty also.

So these are the provisions of UGC regulations 2018. If we talk about the general kind of rules or penalties if a researcher or academician is found guilty they may face different kind of penalties which may include disgrace to both individual and institution, may face disciplinary action as per the institute rules, it can cost a person his or her professional credibility or even a job, debarment from eligibility to receive research funds for grants and contract from any government agencies in India. So these kind of penalties may be there if a researcher or academician found under the plagiarism. If a student found guilty of academic

misconduct then there may be some penalties like requirement for submission of a new or alternative piece of work, university scholarship can be stopped or partial or total loss of marks on the examination or assignment or course in which the offence occurred, suspension from the university or institution, recommendation from the revocation or cancellation of degree. So this is how these penalties can be there if a student found under this academic misconduct. As far as publisher's policy on plagiarism is concerned, so there was a committee on publication ethics that is known as COPE that was established in 1997 by a small group of medical journals editors in UK but now it has more than 9000 members worldwide from all the academic fields.

 So several major publishers are part of this which includes Elsevier, Wiley, Taylor-Francis, Macmillan and so many others. So as per the COPE guidelines on plagiarism, for minor plagiarism cases, for submitted papers the journal can ask, the editor can ask authors to rewrite. If it is already published then the publisher or journal can ask the author to correction. So these are in case of minor plagiarism. As in case of major plagiarism cases, in case of the major plagiarism cases the submitted paper can be rejected or published paper can be retracted or publisher can also inform the author's institution about the same.

  An institute can take the decision based on the kind of plagiarism. So the action is completely depending on the publisher or journal policies what kind of action they want to take. Now let us discuss about the reasons for committing the academic misconduct. Over the time there have been varied reasons for researchers for committing the scientific or research misconduct. One of the reasons for this is career or study pressure. An important factor often associated with research misconduct is the undue pressure researchers face.

 They need to conduct original research in a fast-paced environment, published frequently in peer-reviewed journals and procure funding from research projects to advance their research career. So this along with the need to multiple responsibilities against tight deadlines create undue stress to succeed at any cost. Other important reason for committing the academic misconduct is researchers personal psychology and pressure to succeed. Some researchers may be overly driven by the desire to quickly attain a strong professional reputation or even financial gain which could push them to research misconduct. Another important reason for this committing academic misconduct may be the lack of appropriate training and skills or you can say the inadequate training and awareness.

 The lack of training on the best practices and ethical guidelines to be followed as researchers is another reason for research misconduct. Inadequate enforcement of policies related to academic integrity can contribute to the culture where unethical behaviors is tolerated. Inadequate awareness and understanding on these issues often lead to unethical conduct in research. And the insufficient supervision or mentoring may also one of the important reason which relates to situation where researchers especially early career researchers fails to receive sufficient and appropriate support from the immediate

supervisors or from their affiliation institutions. The lack of oversight and guidance may knowingly or unknowingly lead to the research misconduct.

 Inadequate knowledge. Scientific misconduct can occur if the researcher does not have sufficient knowledge of topic or subject or on research best practices. Carelessness when conducting the research and reporting it are also considered research misconduct. Publishing pressure is also one of the important aspect of committing the research misconduct. The pressure to publish can lead researchers to submit their work to questionable or predatory journals compromising the quality and integrity of research. So, researchers may be tempted to divide their findings into multiple publications to increase their publications count sacrificing the completeness and significance of each study.

 Now why do researchers plagiarize? Apart from all these reasons there may be some other reasons because of those researchers plagiarize. These may be disorganized research work. There may also be poor study habits, cut and paste culture, lack of understanding seriousness of plagiarism, lack of strict academic discipline, carelessness or careless attitude, lack of referencing skills. English as an international language in many non-English speaking countries are also one of the reason for this plagiarism. Funding and career advancement, balancing ethical standards with research goals, inadequate education on academic integrity principles can contribute to unintentional violation.

 Addressing these challenges related to academic misconduct requires a multifaceted approach which can include the promotion of culture of academic honesty, clear communication of expectations, use of advanced detection tools and ongoing education on ethical behavior. So, a multifaceted approach is required. Now what may be the strategies to ensure and promote academic integrity in science communication? Let's talk about this. Ensuring and promoting academic integrity in science communication is crucial for maintaining trust, credibility and the advancement of knowledge. I would like to mention some of these strategies to achieve this which may include clear guidelines and policies.

 This is one of the important aspects because there should be clear comprehensive guidelines for ethical behavior and academic integrity. Clearly outline consequences for plagiarism, data fabrication and other forms of academic misconduct. So, clear guidelines and policies should be there. Another important strategy may be educational and training programs. So, implement educational and training programs to inform researchers, students and science communicators about the importance of academic integrity.

 So, it is a continuous thing and we need to educate them. Provide training on proper citation practices, research ethics and the responsible use of data. So, we need to continue to educate them regarding this. Another important aspect is technology tools. Utilize plagiarism detection tool to identify and address instances of academic misconduct.

 Promote the use of tools that check for image manipulation and data fabrication. So, there

are a number of technology tools which can be used. Open data and reproducibility. Encourage, we should always encourage researchers to share their data and methods openly, promoting transparency and allowing for verification of results. Emphasize the importance of reproducibility in science communication.

 Authorship guidelines is also important. Clearly define the criteria for authorship and contributorship ensuring that all the individuals who have made significant contributions are appropriately credited. Discourage honorary authorship and ghost writing. We should not involve in that. One should always discourage the honorary authorship and ghost writership or ghost writings.

 Ethics committee. As far as ethics committee is concerned, we should always establish ethics committee or review boards to evaluate and address ethical concern in research and science communication. Provide a mechanism for individuals to report ethical violations confidentiality. Mentorship and supervision. Poster the culture of mentorship and responsible supervision to guide students and early career researchers in ethical research practices. We need to encourage open communications between mentors and mentees about ethical consideration.

 Also the public awareness. Increase public awareness of importance of academic integrity. Highlight the consequences of academic misconduct and the benefits of adhering to ethical standards. Ongoing evolution. Regularly evaluate and update policies and practices to adapt to evolving ethical challenges. Solicit feedback from the academic community to improve the effectiveness of integrity measures.

 Finally, creating the culture of integrity. If we are creating the culture of integrity, then I think this will be one of the important strategy in terms of the academic integrity. By implementing a combination of these strategies, academic institutions, publishers and researchers can contribute to a culture of integrity and trust in science communication. So how to avoid plagiarism? We have already discussed so many strategies, but for avoiding the plagiarism, the simple strategy is simply be honest. Understand what is plagiarism? How to detect and avoid it? Read very carefully guidelines for writing thesis, digitations, research papers, research and result reporting.

 Must familiarize yourself with the subject. Must know resources at your disposal. Acknowledge the author of original work you have used. How to cite a source? You need to understand that. Understand what doesn't need to be cited.

 This is also very important. Put your research under open access for more visibility. If you are having more visibility, then the impact will be high of that research. And another important thing related to this, must to do things before you start your research is attend research methodology workshops, English remedial courses, training and reference management tools, library orientation programs and so many other things which may

include the author workshops and course on technical writing skills, etc. So these are the things which the researcher can do before starting the research work. Now what is the role of library or library professional in upholding academic integrity and preventing misconduct? Let's talk about the role of library in this direction. What kind of role a library professional or library can play in upholding academic integrity and preventing misconduct? In accordance with the UGC guidelines, university or institutions is responsible for conducting awareness programs and trainings to sensitize and instruct students, faculty, researchers and the staff members about proper attributions, seeking permission of authors where it was necessary and acknowledgement of resources.

 So libraries can play a crucial role in upholding the academic integrity and preventing misconduct in various ways. Academic integrity is essential for maintaining the credibility and trustworthiness of educational institutions. There are several ways in which libraries contribute to promoting academic integrity and addressing academic misconduct. One of the important role of library is information literacy education. So libraries often provide information literacy programs to help students develop the skills needed to locate, evaluate and use of information ethically.

 These programs educate students about proper citation, plagiarism, and the importance of giving credit to the original source. Libraries need to regularly conduct sensitization seminars, awareness programs on responsible conduct of research, thesis, digitizations, promotion of academic integrity, and ethics in education for students, faculty, researchers and the staff members. So library professionals are the right person for educating the researchers and the faculty members about plagiarism and its related matters. Another important role of library can be the accessing of or access to resources. Libraries offer a wide range of academic resources including books, journals and databases by providing comprehensive and easily accessible resources.

 Libraries contribute to creation of scholarly environment that encourages students to conduct thorough research and cite their sources properly. Under different services, libraries are trained to assist students and researchers in finding relevant and reliable sources. They can guide individuals on proper citation formats, avoid plagiarism, and understanding copyrights, regulations.

 Librarians serve as valuable sources for information ethics. Copyright compliances. Libraries play a key role in ensuring that educational materials comply with the copyright laws. Librarians help users understand copyright restrictions, fair use principles, and licensing agreements, promoting the responsible and legal use of materials. Another important role of library or library professional may be in the field of anti-plagiarism tools or softwares. Many libraries provide access to anti-plagiarism softwares or tools that helps students and faculty identify potential instances of plagiarism in academic work. Libraries need to train students, faculty, or research scholars and staff members in the use of plagiarism detection tools and reference management tools.

Submitted content against a vast, these tools compare submitted content against a vast database of academic and non-academic sources to detect similarities. Code of conduct enforcement. Libraries may have code of conducts that promote ethical behavior within their spaces. This may include guidelines on the appropriate use of resources, respect for others' work, and consequences for academic misconduct.

So this can be very important role of library. Another important role of library is collaboration with academic institution. So libraries collaborate with academic institutions to develop and implement policies related to academic integrity. They may be involved in creating and updating institutional policies that address issues such as plagiarism, cheating, and research misconduct. Promotion of open access sources.

Libraries often support open access initiatives making scholarly information freely available to the public. This promotes transparency, accountability, and the responsible use of academic knowledge. So in this direction, libraries can play an important role. By actively engaging in these areas, libraries contribute to create an environment that fosters academic integrity, discourages misconduct, and promotes a culture of ethical research and scholarship. So at the end, I would like to conclude my talk here and say that the academic integrity forms the bedrock of credit for its valuable and meaningful science communication. This is not merely a set of rules, but a commitment to truth, transparency, and ethical behavior, ensuring that the pursuit of knowledge benefits society as a whole.

Without academic integrity, the very essence of scientific inquiry is at risk, undermining the progress and impact of the scientific community. As far as plagiarism is concerned, it must be prevented at all levels of academic work from student papers to the academic books. India does not have a statutory body to deal with scientific misconduct in academia like the Office of Research Integrity in the US. It can be a very difficult and difficult task to manage and to develop.

We need to understand why students or educators cheat. We need to educate them about the plague of plagiarism. We need to tell them the benefit of citing sources. Let them know about the nature of plagiarism. We need to understand the penalties and consequences by citing examples. Teach them about how to detect plagiarism or teach them about how to avoid plagiarism. Develop an institutional framework, plagiarism policies, open access policies, workshop and training, and proper guidelines.

Stenthening your library's resources and your academic resources is a very important part of the process. So, librarians are best trained in dealing with such issues. At the end, I would like to express my sincere thanks to the authors of various internet sources used to prepare this presentation. Wherever possible, the links have been provided. However, any omission is duly regulated. The presentation is mainly prepared to create an awareness

among students and the researchers about the plague of plagiarism. Thank you once again for joining this NPTEL course. Thank you. Thank you.