

## Narrative Research of Chemistry Lecturer Career Journey: Challenges, Achievements, Scientific Contribution and The Value of Success

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**Abstract:** A chemistry lecturer's experience includes various pedagogical and research activities. This study uses a qualitative method with a narrative approach to explore the story and the views of chemistry lecturers on the experience and its meaning. The results of this study show that many scientific contributions have been made by chemistry lecturers, including cooperation with universities abroad in the development of science and research, as well as collaborative research and publications, to the appointment of post-doctoral fellows. The education system in Indonesia is also one of the significant challenges of particular concern in achieving better education. From the experience of his career journey, there are values of success that have been the principal capital in carrying out his responsibilities as a lecturer and professor, including sincerity, honesty, and sincerity.

**Keywords:** Narrative Research, Lecturer, Contribution, Value, Chemical Education, Achievement, Experience

### INTRODUCTION

A career journey is a complex and multifaceted process involving a series of decisions, experiences and opportunities that shape one's professional path. It includes educational choices, skills development, job transitions and personal growth. A lecturer's career journey is a multifaceted and dynamic process involving multiple stages and experiences. It includes the transition from student to post-PhD researcher and finally to new lecturer (McAlpine et al., 2014). This journey often involves significant personal and professional development; as individuals face the challenges and opportunities inherent in academia, the dilemmas that individuals face are in choosing between traditional career paths and pursuing their unique or limitless careers. The metaphor of a journey or path helps to illustrate the diverse career options available to individuals.

The career journey of a chemistry lecturer involves various challenges. Chemistry lecturers face challenges in education, such as encouraging cumulative knowledge development and scientific communication skills (Rootman-Le Grange & Retief, 2018). In addition, prevailing practices in chemistry education at the university level mainly focus on algorithmic or low-level cognitive skills, which poses a challenge for lecturers (Zoller et al., 1995). Another challenge is the adjustment of chemistry lecturers in teaching with inadequate educational facilities. Chemistry lecturers face challenges in conveying abstract concepts effectively, as traditional teaching methods may not adequately explain the relationship between concepts and scientific models (Barthlow & Watson, 2014). Chemistry is often considered abstract due to its complex concepts and scientific terminology, making it difficult for lecturers to convey these ideas to students effectively (Sausan et al., 2018). Concepts in chemistry frequently require students to understand and move between macroscopic, submicroscopic, and symbolic representation systems (Rahayu et al., 2011). Departing from this, the role of lecturers is very important in determining the success of chemistry

learning at university because the delivery of comprehensive material, motivation and inspiration, and lecturer involvement in research can bring new insights or experiences in the classroom.

Chemistry lecturers play an important role in the advancement of science. Inspiring stories of achieving career success by balancing professional and scientific responsibilities can be important to understanding the views of chemistry lecturers. However, empirical studies have seldom examined success stories and challenges in active chemistry or professors, and researchers have not explored professors' views on their career trajectories (Avargil et al., 2023). From this view, chemistry professors must have values that guide them in making decisions and carrying out responsibilities throughout their careers.

The career success of a chemistry lecturer is closely related to his scientific contributions and scientific guidance. Scientific contributions such as research publications and mentorship are important indicators of a lecturer's success. Active research and publication of scientific papers are recognized as essential for lecturers to demonstrate broad knowledge in their research fields (Harsasi et al., 2021). Collaborative research and publications have been shown to have a significant impact on citation rates in biology, biochemistry, and chemistry (Didegah & Thelwall, 2013).

The value of a chemistry lecturer's career success can be measured through the recognition and awards he receives. For example, Louis Fieser, a renowned organic chemist, was awarded the James Flack Norris Award in Chemistry Teaching, the Association of Manufacturing Chemists Award in Teaching, and the Nichols Award from the ACS New York Section, which recognised his outstanding expertise as a chemist, lecturer, teacher, and author *Organic Chemistry* (Lenoir & Tidwell, 2009). Similarly, the Nobel Prize in Chemistry was awarded to Heeger, MacDiarmid, and Shirakawa for their discovery and development of conductive polymers, highlighting their significant contributions in this field (Solazzo et al., 2019).

A narrative approach can be used to uncover the stories of chemistry lecturers' experiences in their career journeys. Narrative research covers various aspects of lecturers' professional development and experiences by utilising existing reference insights. This study aims to explore the experiences and challenges of chemistry lecturers while carrying out their responsibilities as educators and contributing to innovation and new discoveries in chemistry. Using narrative inquiry to access stories and experiences provides a methodological framework for exploring lecturers' experiences through a narrative approach (Savin-Baden, 2013).

This research explores chemistry lecturers' personal and professional experiences, highlighting their struggles, achievements, and the impact of their scholarly work on the academic community and society as a whole. Narrative research gives participants the freedom to raise issues that are meaningful to them, making it a valuable tool for exploring social justice discourses in educational policy development (Carless & Douglas, 2017). In addition, narrative research has been recognised as a legitimate methodology in qualitative research, providing a platform for individuals to express their personal journeys and experiences. By conducting narrative research, the author was able to describe an inspiring journey and reveal the positive impact of a chemistry lecturer on the field of chemistry and higher education.

## METHOD

### Research Design

This research uses qualitative research. Qualitative research is a study consisting of a series of interpretations and material practices that make the world visible (Cresswell & Poth, 2018). Qualitative research can also be defined as the idea of investigating or investigating something systematically (Merriam, 2009). The qualitative research used adopts a narrative research approach where researchers focus on one person's research, obtain data from collecting stories, report individual experiences, and discuss the meaning of these experiences for individuals (Darmanita &

Yusri, 2020). Narrative research is a research method that begins by telling stories or stories of individual life experiences told by the individual (Cresswell & Poth, 2018). Narrative research focuses on individual experiences and rewrites them in the form of narrative chronology (Afan Faizin, 2020). Therefore, by using a narrative research approach, researchers can describe an inspiring career journey and reveal challenges, scientific contributions, achievements, and positive values or impacts that can be taken from a chemistry lecturer related to the field of chemistry itself and higher education.

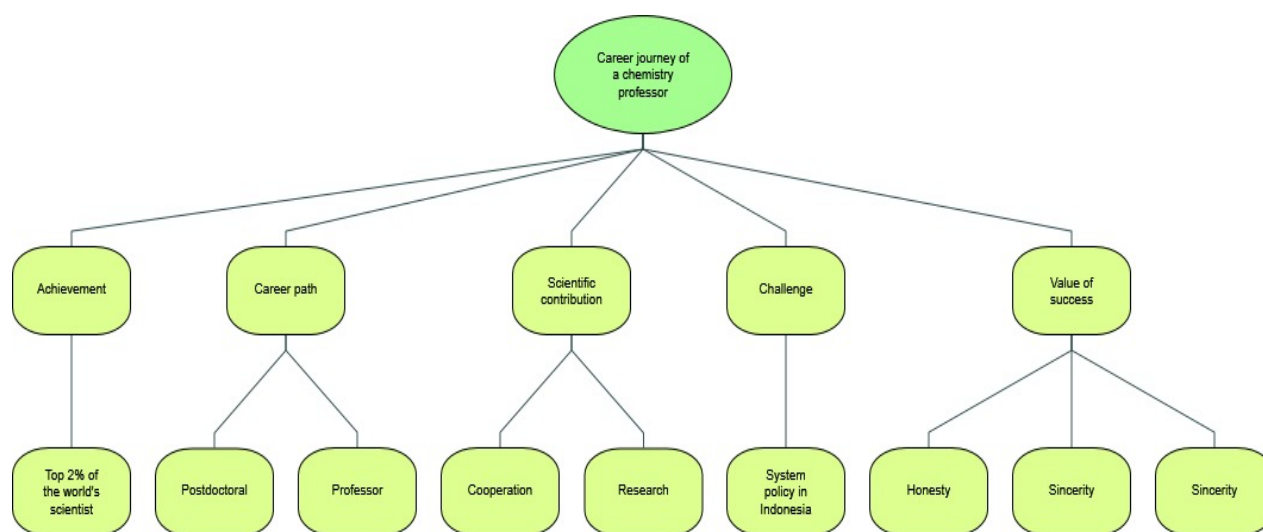
### Research Data

The participant in this study was a chemistry lecturer at the State University of Malang. This participant was chosen because he had experienced this situation so that he could provide an understanding of the experience of an inspiring career journey along with the dilemmas faced during his career journey and reveal challenges and contributions related to the field of chemistry and higher education. The research place or location chosen is in the joint lecture building A19, State University of Malang, located at Jalan Simpang Bogor, Sumber Sari, Lowokwaru, Malang City.

Data collection techniques included interviews, participant blogs and documentation. Interviews were used to obtain in-depth data on the experiences of the lecturer's career journey and the dilemmas he faced, as well as collecting documentation related to his career journey. Data collection tools in narrative inquiry are often unstructured interviews, which provide a platform for individuals to share stories in their own words (Adhikari, 2021). The narrative interview process involves capturing and transcribing data, which can then be analysed in various ways (Lim et al., 2021). The participants' blogs consisted of many posts containing their career journeys, opinions, and teaching activities during their time in chemistry. Thus, blogs became an additional source of data collection in this study.

### Data Analysis

This research instrument includes an interview guide. A planned interview should be equipped with an interview guide in the form of a list of questions that have been previously compiled. Interview guidelines greatly assist the interviewer in maintaining the direction or topic of the interview (especially in interviews containing structured questions). In addition, interview guidelines that have been prepared in advance guarantee the completeness of information (Pujaastwa, 2016). The interviews were transcribed and then read back. Transcribing and reading the interview is essential in many research and clinical settings. The quality of the transcription process is critical, as it directly impacts the subsequent analysis and interpretation of the data. Transcription of the interviews is a common practice to ensure preservation of the original content and context (Kristensson & Björkdahl, 2020). A narrative analysis of the collected data was conducted to interpret and construct the answers of the participants in relation to their experiences of being a lecturer in chemical education. The process of interpreting the narrative interview data involved transcribing the interviews and then analysing the transcribed text to identify themes, patterns, and meanings (Nasheeda et al., 2019) in interview transcripts. This software facilitates the management and coding of qualitative data, making it a valuable tool for researchers in various fields. *NVivo* allows researchers to conduct thematic analysis, a widely used method for identifying, analysing and reporting patterns in qualitative data. The software provides a platform for organizing and categorizing data, enabling the systematic exploration of themes and patterns within data sets (Lavall et al., 2022).



**Figure 1.** Coding narrative interview transcript data

This resulted in five main themes reflecting the participants' career experiences. Among them are career journey, scientific contribution, challenge, value of success, and achievement. After coding and categorization, these themes will be interpreted to reveal underlying patterns, insights, and implications related to the travel experiences of chemistry lecturers. Mini stories refer to the themes that have been identified; storylines and narratives from participants are then developed, which are included in the story correlation that describes the participants' experience during their time as lecturers (Tong et al., 2007).

## RESULTS AND DISCUSSION

### *Career path: postdoctoral researcher and professor*

The process of one's life journey is multifaceted and interesting, involving many challenges and opportunities. It describes the transition from undergraduate to post-doctoral student and, ultimately, to new lecturer (McAlpine et al., 2014). This journey often involves significant personal and professional development as individuals face challenges and opportunities. This narrative research was designed to explore the career journey of a chemistry education lecturer as well as his challenges, scientific contributions, and values of success. The participant's career journey began 25 years ago as a postdoctoral researcher at UTM in 1998, and 1 year later became a postdoctoral researcher at Hokkaido University.

"After graduating from my PhD, I became a postdoctoral researcher at UTM, and I was appointed as a professor at UTM at a very young age of 41. During this career journey, I faced no dilemmas. Deciding from UTM to UM is not a dilemma, but it is a life choice because I want to contribute to my home country (Indonesia); there are many things that need to be done in Indonesia".

Quoted from the participant's blog wrote, "There are three important events that are quite impressive during his career journey including, First when he was appointed as a professor at Universiti Teknologi Malaysia (UTM) in 2010, second when he was awarded the title of adjunct professor by the State University of Malang (UM) in 2017, finally, when he received a Decree (SK)

of appointment as a professor at UM by the Minister of Education, Culture, Research and Technology, Nadiem Anwar Makarim, which took effect on August 1, 2021.

"I describe the professor as not just a title, but there is an important term that is expected, namely 'professorship', which refers to the nature and authority of being a professor. This authority cannot be judged solely by numbers, such as the number of publications and citations, because it can only be seen through the eyes of a peer group".

### ***Scientific contributions: research and cooperation***

Based on experience, participants have made many contributions to research and cooperation. Participants are very excited when teaching in class; this is said because when participants teach, many ideas are conveyed to students. Participants are also diligent in writing, including writing books and blogs.

"As a lecturer, I personally have the main task as a teacher, and I fulfil my responsibilities as a scientist by conducting research. In the field of research, I contribute to the development of the Indonesia Malaysia Research Consortium (IMRC), collaborative research and publications, and the appointment of post-doctoral fellows. My research concentrates on the development and characterization of advanced materials and heterogeneous catalysts. This involves a multidisciplinary approach combining materials science, heterogeneous catalysis, biomaterials, fuel cell science, and engineering, aiming to utilise these new materials in emerging technologies".

Quoted from the blog, participants wrote an article related to scientific research entitled "Dancing in the Melody of Research". Participants mentioned that fun research can produce many useful works.

"To produce impactful and innovative research, we must recognize that research should ideally be "*playful*", filled with exploration and creativity, not just focused on end results such as publications. "*Playful*" here describes an approach that is full of excitement and creativity and often not bound by strict rules or structures. This approach paves the way for more flexible and innovative research. Successful scientists are often known for their ability to think outside the box, see connections that are invisible to others, and take risks in their explorations. They treat research as an intellectual game, where curiosity and the excitement of discovery are the main drivers, not just the publication of the final results.

Adopting this view in research means seeing each experiment, theory and hypothesis not as a step towards the ultimate goal of publication but rather as part of an ongoing creative process. Every failure is not the end of the story, but the beginning of a new chapter, with opportunities to learn and grow.

Participants also mentioned that in the development of chemistry, participants collaborated with many foreign universities.

"I sent a chemistry lecturer to a doctoral program at Osaka University, which I was able to do because of the good relationship with a friend that has been established until now".

With participants contributing to the opportunity for lecturers to pursue education abroad, it certainly provides lecturers with the opportunity to engage with diverse perspectives, innovative teaching methodologies, and cutting-edge research, which ultimately enhances their pedagogical skills and knowledge base (Çimşir & Uzunboylu, 2019). It allows them to gain exposure to international best practices in education, educational technology, and instructional design, which

can be integrated into their teaching approaches (Baglama et al., 2018).

### ***Challenge: system policy in Indonesia***

The career journey of chemistry education lecturers is inseparable from the challenges faced related to the university education system in Indonesia, where there are still many things or policies that need to be improved because they are still not relevant if used to improve the education system in Indonesia to have almost the same quality as universities abroad. This is what can be the main challenge in the higher education system in Indonesia.

"One of the criteria for a good university is that the ratio of lecturers to students is ideally 1:7. This ratio is usually found in renowned universities abroad such as Stanford, MIT, etc.). Whereas in Indonesia, the ratio of students is many times the number of lecturers or teaching staff available. In my opinion, this can clearly violate the existing academic ethics following Edward Shills' book. Because it will be difficult to control students in the classroom, which ultimately learning activities cannot take place properly or lecturers teach carelessly".

The ideal ratio of lecturers to students in an Indonesian university is often considered to be 1:25 (Razalli et al., 2021). This ratio is critical to ensure effective management of teaching workload and student engagement. The relationship between lecturers and students is crucial in the academic experience, and it is known that lecturers' social identity can influence their expectations of ideal students (Wong & Chiu, 2018). Furthermore, the impact of lecture hall design on the learning experience underscores the importance of lecturer-student ratio and space utilization in academic programs (Fleming & Storr, 1999).

"I think another challenge in Indonesia's education system is that universities must provide good facilities to support classroom learning".

Universities play an important role in providing an environment conducive to learning, and the quality of facilities available has a significant impact on student satisfaction and academics (Hanssen & Solvoll, 2015; Kim et al., 2018; Ndirangu & Udoto, 2011; Ramdani & Nurmayanti, 2021; Wijaya et al., 2023; Zurainan et al., 2021). Providing up-to-date information and effective learning processes are facilitated by good library facilities (Zurainan et al., 2021). In addition, high-quality facilities have been shown to have a major impact on learning and influence students' decisions when choosing a university (Hanssen & Solvoll, 2015). Improving the quality of educational facilities is essential to enhance student learning and the learning environment (Ndirangu & Udoto, 2011). Availability of classroom facilities and instructor expertise significantly affects student satisfaction in higher education. The time students spend inside the university has resulted in greater indoor exposure, thus emphasising the need for a suitable learning environment for students, including ideal lecturer presence (Majewski et al., 2018).

Another challenge can be publication policies, quoting from the participant's blog writing about "Reforming the Scientist Evaluation System" some views on policies related to publications. The participant's writing highlights that publications no longer look at quality but quantity.

"Over the years, this 'paper dictator' oriented system has reduced the quality of research and encouraged unethical practices and ignored other important aspects of scientific research such as innovation, practical applications, and collaboration with non-academic communities. By prioritising quantity of publications over quality and real impact, the old system has come at the expense of true scientific innovation and progress. It is also important to note that this change benefits the scientific community and society as a whole. By reducing the focus on

publications and encouraging open access, research can become more transparent and accessible to a wider public, thus increasing scientific research's social and educational impact".

The importance of scientific publications that follow good rules for academics cannot be overstated. Scientific publications not only disseminate research findings, but also serve as a measure of academic success and recognition. The integrity and quality of scientific publications is very important. Prevention of publication bias is essential for the overall dissemination of knowledge and the validity of meta-analysis (Dickersin, 1990). In addition, journal impact factors have become deeply rooted in the evaluation of academic success, shaping reward signals for scientists and influencing publication prospects (Paulus et al., 2015). Participants also wrote in another article with the title "Towards Quality Research"

"Research that is conducted carelessly, without following proper scientific guidelines, without scientific ethics, or that only aims for quick publication, ultimately only produces insubstantial work. While they may look impressive in bibliometrics, they have no real impact. Ironically, this is the reality we are currently facing, which contributes to the emergence of scientists who are not credible".

#### ***Values: sincerity, sincerity and honesty***

The career journey of a chemistry lecturer is influenced by several factors such as work experience, decision making, and dimensions of career success (Brown, 2002). The values that are interpreted from the participants' career journey as chemistry lecturers have been identified as important variables in the career development process.

"The first value that is important in my opinion is sincerity, sincerity is my capital while undergoing this profession so that I can *survive* abroad, sincerely befriending people and people will see our sincerity, sincerity is difficult to define but we social creatures can feel if the person is sincere tous".

The value of sincerity in developing a career is a topic that has attracted attention in the academic literature. Sincerity is often considered a fundamental personal value that can significantly influence the development of one's career success. Several studies have explored the role of sincerity in developing career, providing valuable insights into about its influence on various aspects. One important reference that explores the value of sincerity in career development is the work of Smith and Johnson (2018). This study investigates how sincerity, as a personal value, influences individuals' career trajectories and their ability to build meaningful professional relationships. The next value that participants interpreted in their career journey was sincerity.

"I analogize sincerity to a black ant walking on a black rock, if in the religious view sincerity is only ourselves and God who knows. Because sincerity is actually difficult to assess".

The importance of sincerity in carrying out tasks is something that must be underlined. Interactions between chemistry lecturers in fostering meaningful relationships with students and colleagues show a positive correlation between academic fit and career exploration, indicating that sincerity in aligning academic teaching with career aspirations contributes to the development of meaningful careers among students (Sawitri & Dewi, 2015). This finding underscores the importance of sincerity in guiding students towards a fulfilling career path. Participants also mentioned the value of honesty as a value that is an asset in carrying out responsibilities as an academic. The value of honesty in the careers of chemistry lecturers affects various aspects of their professional responsibilities. Integrity, honesty, and ethical behavior are fundamental to the academic role.

"For me, honesty is a value that is basic to us as humans".

"I was given responsibility so that I can control many people, all of which is inseparable from the value of honesty. I want this Institution to progress and that's it".

From all these values, participants remind us that we must still prioritize *sharing culture*, prioritize *empathy and logic* so that we can achieve *wisdom*. Where the emotions that come out will be positive.

"Hopefully, at this age I can make something and leave a good *legacy*". Quoting from a participant's blog "If no one has laughed at your dream to educate the nation's children, then your dream is still not big enough".

### ***Achievements: Top 2% of the world's scientists***

Lecturer career success is a multi-faceted concept that encompasses a variety of factors. Lecturers have an important role in Indonesia's education system, as educators and researchers, who contribute to the development and dissemination of knowledge and skills in society. Academic achievement plays an important role in determining the success of lecturers in their careers. One of the main criteria for success is an academic's international reputation and recognition, which is often measured by the number of citations to their work (Beigi et al., 2018). In addition, the maintenance of personal reputation is considered a precursor to career success, highlighting the importance of reputation in academic careers (Urip & Kurniawati, 2020). The quality of lecturers' achievements has a significant effect on the overall quality of higher education (da Silva Andrade et al., 2020; Kurniawati et al., 2021). In Indonesia, lecturers are expected to have pedagogical, personal, social, and professional competencies (Suhaemi & Aedi, 2015).

The importance of lecturers' achievements is further emphasised by the fact that they are responsible for preparing lesson plans, teaching, assessment, supervision, research, community work, and other identified tasks (da Silva Andrade et al., 2020). In this study, participants had many academic achievements. Still, the most interesting achievement was being listed among the World's Top 2% of Scientists for 2021, 2022, and 2023, according to the Elsevier Data Repository. The award was created by Dr. John P.A. Loannidis and his colleagues at Stanford University. The award was achieved by the participant for 3 consecutive years.

## **CONCLUSIONS**

The career journey of a chemistry lecturer is closely related to various challenges, achievements, scientific contributions, and the value of success. By using a narrative approach, researchers were able to explore and find out the meaning related to the experience of chemistry lecturers. The chemistry lecturer's career journey began with becoming a postdoctoral researcher and then continued to get a professor's degree; during the career journey, there were no dilemmas he faced. The challenges of chemistry lecturers are related to the education system in Indonesia where there are still many policies that need to be improved to improve the quality of education in Indonesia. The participants' scientific contributions include collaboration with universities abroad and many contributions in the field of research, one of which is developing the Indonesia Malaysia Research Consortium (IMRC), collaborative research and publications, and the appointment of post-doctoral fellows. From the experience of the participants' career journey, we can learn about the values of success, including sincerity, honesty, and sincerity.

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