

A report of a quantitative study on an investigation into Job Satisfaction of Chinese University online teaching during the pandemic (since 2020)

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October of 2023

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Abstract

Since the pandemic began globally in early 2020, universities around the world have closed their campuses and implemented online teaching models. Against this background, this study through a quantitative research method aims to investigate the Job Satisfaction of lecturers in China since 2020 and to investigate whether the support universities provide to lecturers affects their job satisfaction. In addition, this study uses the Perceived Organisational Support theory as the theoretical framework and researches this basis. For quantitative research methods, it is important to flexibly use SPSS for data calculation and analysis. In this study, SPSS was used to analyse and verify many questions in the questionnaire. The main findings are that most lecturers have high job satisfaction with online teaching during the epidemic period, and the support provided by the university can greatly affect their job satisfaction.

Keywords: quantitative research method, Job satisfaction, online teaching, pandemic

1, Introduction

1.1 Background

Due to the sudden global spread of COVID-19 in December 2019, most countries implemented lockdown policies within a few months, and most universities had to close their campuses and transfer all courses from traditional offline face-to-face teaching modes to online teaching modes in order to prevent the rapid spread of COVID-19 virus (Chakraborty et.al, 2021). After the observance of the Chinese New Year in 2020, a majority of Chinese educational establishments opted to postpone the commencement of the spring semester. Consequently, students, professors, and administrative personnel were required to get explicit permission from the university administration before returning to campus. Zhu and Liu (2020) reported that the Ministry of Education has introduced a scheme called "Stopping Classes but Not Stopping Learning" with the aim of facilitating adaptable online learning opportunities for a substantial population of over 46 million college and university students. Institution educators use several online learning tools, such as RainClassroom, Zoom, DingTalk, Tencent Meeting, and others, to facilitate student guidance outside the confines of the institution (Kong et al., 2021). Online instruction is characterised by its ability to be replicated, as opposed to the traditional offline classroom teaching methods. In this context, students have the advantage of accessing recorded classroom sessions, therefore addressing the challenge of keeping pace with the lecturer's

instructional speed as seen in conventional teaching approaches. In February 2020, the China Education and Research Network (CERNET) declared a state of wartime protection in order to facilitate the seamless functioning of online education in colleges and universities worldwide. As part of this initiative, CERNET pledged to provide assistance to universities seeking to enhance their broadband networks amidst the ongoing pandemic (Xinhua News, 2020). Although optical fibre and 4G coverage in China's administrative villages hit 98% in 2020, and network connection conditions for universities and colleges in rural and remote locations have steadily improved, blind spots remain (Xinhua News, 2020). According to figures from the beginning of 2020, 1,451 universities throughout the country have launched online classes, with over 950,000 professors giving 942,000 online courses (Duan, 2020, China Education News). In a recent study conducted by Yin, Lu, and Meng (2022), it was found that university lecturers in China's online teaching environment often lack sufficient preparation and training when transitioning from traditional face-to-face classroom instruction to online teaching. Additionally, the study revealed that certain university lecturers frequently encounter difficulties in designing high-quality course content and facilitating meaningful online teaching interactions. The absence of body language and immediate reaction poses significant hurdles for lecturers in remote communication, hence impeding effective communication. Additionally, Blonder et al. (2022) have identified many additional obstacles that further compound these difficulties.

Moreover, internet-based instruction might be considered a kind of obligatory remote work for educators. The COVID-19 pandemic has had a significant effect on senior academics at universities, making them one of the occupational groups most affected by this problem. As a result, the new reality formed by the pandemic is expected to have an influence on the level of job satisfaction experienced by lecturers (Mahmood & Saleem, 2023).

1.2 Research aim/objectives/questions

The research aim:

This study aims to examine the evolution of job satisfaction among university lecturers in online teaching since the onset of the COVID-19 pandemic in 2020. Specifically, it seeks to explore the relationship between university management and lecturers' job satisfaction, with a particular focus on the role of online learning platforms and online teaching in shaping job satisfaction among university lecturers. The fundamental objective of this quantitative research is to ascertain the perspectives of a significant number of Chinese university professors on their job happiness amidst the ongoing pandemic since 2020. This will be achieved via the collection of a substantial number of questionnaires. The conclusions of the research will be deduced via meticulous examination and analysis of the data.

The research objectives:

1. To assess Chinese professors' work satisfaction.
- 2, To investigate the shift in work satisfaction of professors from conventional to online education.
- 3, To give suggestions for the necessary management systems at the institution.

The research questions:

- 1, What is the measurable impact of online teaching platforms on lecturers' job satisfaction?"
- 2, What is the relationship between lecturers' online teaching experiences with students and their overall happiness and job satisfaction?"
- 3, What is the lecturers' quantitative assessment of the effectiveness of current online teaching technologies?"
- 4, What are the measurable strategies that the university management and administration department can implement to assist lecturers in managing students through online platforms, with the objective of minimising lecturers' daily workload?
- 5, What are the actions taken by the university to address the wellbeing and happiness concerns of lecturers in the context of substantial computer workloads?"

1.3 Research significant

This quantitative research paper investigated and analysed the work satisfaction of Chinese university professors utilising online platforms for online education in the epidemic phase commencing in 2020, which was statistically evaluated using 100 questionnaires. In addition, this study provided a comprehensive theoretical framework regarding the job satisfaction of tertiary lecturers, examined ethical issues, and concluded with a discussion of the limitations of this quantitative study and suggestions for future research.

2, Literature review

2.1 Job Satisfaction for Lecturers

Job satisfaction and personal happiness at work have always been an actively discussed topic, not only for large businesses, small organisations, universities, employees, and lecturers alike. A person's evaluation of their work experience and position after taking all relevant elements into account might result in a number of pleasurable, positive, or negative emotional states, according to the definition of job satisfaction." (Cerci & Dumludag, 2019).

Wnuk believes that for employees, the higher the overlap between their personal attitudes and ideas and the organizational values, the higher the sense of belonging and satisfaction that employees will experience at work (Wnuk, 2017). An employee experiences job satisfaction when they possess job stability, opportunities for professional growth, and a healthy work-life

balance, as these factors align with their expectations for their role. The concept of job satisfaction is characterised by its subjective nature, indicating that it varies across individuals (Wangler et al., 2022). The factors influencing employee satisfaction include remuneration, perks, and assets, alongside the organisational environment, culture, and job quality (Skool team, 2023). The level of job satisfaction experienced by lecturers has a significant impact not only on their own well-being, but also on their job performance as educators, which in turn affects the academic outcomes of their students (Fütterer et al., 2023). The level of job satisfaction might potentially influence an individual's motivation to engage in their work in a good manner. Conversely, a deficiency in contentment may have the opposite outcome (Chen, 2014). A study in 2010 showed that lecturers with high job satisfaction have a proactive and even enthusiastic working attitude, which increases students' intrinsic motivation and improves their energy level (Patrick et al, 2010). Research clearly shows that successful lecturers not only teach well and create the best learning environment for their students but also experience happiness and a high degree of satisfaction in the course of their work: being able to provide good guidance and being satisfied with their work are both necessary in defining an effective lecturer (Klusmann et al, 2008). Lecturers' job satisfaction is important for their well-being, turnover, and retention. This means that when lecturers do not experience high levels of job satisfaction, their commitment to the organization and their career decreases and they leave (Klassen & Chiu,

2011). Dong & An described the relationship between lecturers and platforms in an article on lecturers' experience of online teaching published in 2021 as follows: In the context of online education, for lecturers, their sense of work experience is very important. According to Dong and An (2021), the professor and the online platform provide genuine connection, including both "soft" interaction between people and the platform, as well as "hard" engagement between humans and robots. According to Lin (2022), online teaching in Chinese higher education was mostly used as a supplementary tool to enhance traditional face-to-face instruction prior to the outbreak of the pandemic. The expeditious shift of all existing courses to an online format within a short timeframe is a substantial and disruptive alteration. Given the lack of preparedness among lecturers and students for comprehensive online instruction, several challenges arise during this transitional phase. However, since COVID-19 sprang out of nowhere, most lecturers struggle with a lack of prior online teaching experience, early preparation, or help from the education technology team (Bao, 2020). Han, Gao, and other scholars argue that in comparison to traditional teaching techniques, online education imposes more responsibilities on educators in terms of using effective teaching strategies, conducting comprehensive lesson planning, and enhancing classroom management. Based on empirical investigation, the level of satisfaction among senior lecturers in relation to their teaching proficiency is contingent upon their emotional responses towards the perceived association between

teaching demands and the availability of teaching resources (Ho & Au, 2006).

In order to ensure effective online instruction, it is imperative for universities to establish a comprehensive framework that facilitates the acquisition of pedagogical and technological competencies by professors and lecturers.

This entails the provision of systematic and professional training resources, which not only enhance their content knowledge but also equip them with the requisite teaching and technical proficiencies for online teaching (Wang et al., 2021).

In addition, it is imperative for administrators to establish protocols for assessing lecturers in digital learning settings. These protocols may

encompass various aspects, such as the duration of video lectures, the

quantity of messages shared in group chat platforms, and the extent of

feedback delivered to students. By implementing these policies, lecturers will

be able to effectively gauge their teaching effectiveness and maintain a

consistent standard of quality (König et al, 2020). To ensure the efficient

implementation of online education during the time of pandemic prevention

and control, the Chinese Ministry of Education collaborated with the Ministry

of Industry and Information Technology, as well as telecoms carriers, at the

beginning of 2020. This measure was implemented in order to guarantee the

provision of network services for universities and educational platforms across

all levels. The China Education Network (2020) provides a range of service

guarantees that are of high quality, including complimentary mobile phone

traffic, network broadband, and cloud service capabilities. Furthermore, as

Dhawan (year) asserts, a robust information technology infrastructure is crucial in ensuring the resilience of the education sector during times of crisis. In order to guarantee the continuous provision of educational services, it is essential for the government and other relevant stakeholders to collaborate in the establishment and upkeep of the necessary infrastructure (Dhawan, 2020).

2.2 Educational social software and Online learning/teaching platforms

Social software has had a significant impact on both personal lives and daily practises, as well as educational environments, across several platforms. In order to optimise the use of social media technologies, educators endeavour to include these practises into their classroom instruction (Sabah & Altalbe, 2022). Social media is used by educational institutions to connect with different user groups and provide various services in order to enhance the learning process. This includes interacting with alumni and the general public, enhancing the academic experience, and offering guidance and support to students (Sideri, 2019). Within a little timeframe, the COVID-19 pandemic has necessitated the transition from traditional pedagogy to online instruction, compelling university educators to develop and implement a substantial amount of online teaching content. During times of crisis, the only viable alternative is to transition to online courses, especially in cases when students

and teachers may not possess sufficient preparation or exhibit little enthusiasm for online teaching (Cutri, 2020). The use of the Internet and social media platforms has the potential to enhance students' ability to engage in autonomous learning. Based on a study conducted in 2017 about the efficacy of social media in the realm of education, it was found that students exhibit a willingness to allocate the necessary time and exertion in order to use social media platforms for the purpose of acquiring comprehensive knowledge and honing their skill sets. Kutbi and Alomar (2017) posit that students will encounter a sense of pride and will retain the process of constructing their own living knowledge in their memory for a considerable duration. Online learning varies from offline learning due to the lack of a strong connection between lecturers and students. Taking Peking University as an illustrative case, lecturers at this institution have used many strategies to enhance the learning experience for students. One such approach involves the division of courses into smaller units, allowing students to concentrate on specific topics. Additionally, a pedagogical emphasis has been placed on the auditory aspect of teaching, with lecturers employing various techniques to enhance the delivery of course content. Furthermore, teaching assistants are utilised to provide additional advice and assistance to students. Lastly, assignments have been designed to promote active learning, encouraging students to engage actively with the course material. During the outbreak, DingTalk and Tencent Meeting have emerged as the most widely used

communication platforms in Chinese universities. According to the results of a questionnaire survey conducted by China Academic Journal Electronic Publishing House on lecturers' satisfaction with the utilisation of DingTalk, a majority of professors and lecturers said that DingTalk is capable of meeting their employment requirements. The absence of latency in live training may be attributed to the real-time generation of instructional data via DingTalk online instruction. According to Dong (2021), the platform offers a comprehensive range of capabilities, and the live instructional activities are carefully designed and user-friendly. Furthermore, as shown by a recent research conducted in 2021, the majority of educational institutions and lecturers have become used to using Tencent Meeting as a platform for conducting online classroom discussions. This choice is primarily driven by the platform's ability to transcend limitations related to physical location and technological constraints (Su et al., 2021). Furthermore, Tencent Meeting offers the functionality of a "collaborative whiteboard," which allows the meeting organiser to extend numerous whiteboards concurrently and enables the presenter to write on the virtual chalkboard at any given moment. These functionalities enable the lecturers to present their computer screen and PowerPoint slides in real-time.

2.3 The identities alter the context of online lecturers

2.3.1 Management Identity Changes

The rise of online education has prompted institutions to improve or even create online learning management systems as an alternative to traditional in-person teaching methods. Moreover, the process of arranging educational materials and transforming them into digital or video media formats requires a significant amount of work on the part of educational institutions. Furthermore, it is essential that they be accurately and expeditiously uploaded to the learning management system (Ei-soussi, 2022). During the transitional period, it will be necessary for administrators to provide technical support to lecturers and other university staff members. This support will be particularly important for those workers who are not yet familiar with the new online learning platforms, as it will enable them to develop proficiency in using these platforms. According to Parlaklıç (2014), it is essential for leaders to promptly initiate the process of identity transformation and acknowledge the importance of change in the early stages of mobilising followers to implement change and undergo identity transformation.

2.3.2 Lecturers' identity changes

Based on the findings of this study, it is suggested that the responsibilities of the lecturer may undergo a transformation from being a "lecturers within the physical classroom" to assuming the position of a "facilitator of online learning" after the transition from traditional teaching methods to an online instructional approach. During face-to-face instructional sessions, educators

have the flexibility to move about the classroom at their discretion in order to evaluate the progress of individual students and get feedback. Nevertheless, teachers may have difficulties in obtaining feedback from students during online learning due to the absence of their active participation, which practically renders them non-existent. Academic lecturers are burdened with several supplementary tasks, including the dissemination of class-related material to students via electronic mail and the exploration of alternate resolutions to their concerns.

2.3.3 Theoretical framework

The use of a comprehensive theoretical framework might greatly enhance the researcher's ability to achieve success in later study and writing endeavours.

The theoretical framework plays a fundamental role in providing the researcher with a historical backdrop and basis for their forthcoming study, hence being essential to the completion of the full research report (McCombes, 2020). The use of a theoretical framework serves to support the researcher in conducting further investigations and addressing the inquiries raised by the researcher. The findings and conclusions of this study may be determined by researchers via the use of the theoretical framework in order to guide further research procedures and analysis (Lederman, 2015).

2.3.3.1 Perceived Organisational Support Theory

The perceived organisational support hypothesis was suggested by Eisenberger et al. (1986). The construct known as perceived organisational support theory (Eisenberger et al., 1986) pertains to the perspectives held by employees about the extent to which their company demonstrates concern for their well-being and acknowledges their contributions. According to Shanock et al. (2020), the loyalty of employees towards their organisation, as well as other favourable attitudes and behaviours shown by employees, might potentially be impacted by POS. The perception of organisational support by employees is of utmost importance in the current highly competitive work environment, benefiting both people and businesses. It is important for organisations to give precedence to the job expectations and desires of their employees in order to effectively retain and engage them. The objective is to enhance the overall worth of the company (Li et al., 2022). In order to foster long-term employee retention, businesses must provide a work atmosphere that is friendly, while implementing programmes and policies that are attractive to their workforce. The opinions of employees about the organization's intentions for their good or negative treatment play a pivotal role in the concept of good Organisational Scholarship (POS). Employees are motivated to support the organisation in attaining its goals and objectives, since they expect that more effort will lead to greater advantages due to perceived organisational support (Kurtessis et al., 2015). According to Li et al. (year), the aspects of perceived organisational support (POS) include empowerment, supervisory support, mentoring, and

organisational trust. According to Li et al. (2022), the generation of positive organisational support (POS) is contingent upon workers' experience and perception of the four aforementioned elements. This, in turn, activates their intrinsic drive and ultimately leads to an enhancement in employee performance. Research has shown the existence of a "exchange relationship" between businesses and their respective workforces. When a company engages in actions that are advantageous to its staff, it is expected that the workforce would reciprocate accordingly. This measure is expected to enhance the level of dedication shown by the staff towards attaining the objectives set by the company. The concepts of commitment and devotion have been discussed by Blau (2017). Individuals are more prone to attaining elevated levels of perceived organisational support (POS), denoting that the perception of support from the organisation is focused on both the individuals and the firm, when a corporation has a supportive and positive demeanour towards workers' contributions, demonstrates concern for their well-being, and treats them equitably. The concept of establishing a relationship via an exchange is worthy of appreciation.

Empowerment:

According to Conger and Kanungo (1988), empowerment is posited as an intrinsic motivator that fosters the cultivation of actions geared towards change. According to Chiang and Hsieh (2012), empowerment has the

potential to foster employee engagement, enhance job motivation, and cultivate a stronger sense of organisational belonging. The response of employees towards their employment is likely to be influenced by the perception that the organisation places importance on their contributions and demonstrates faith in their abilities. According to Kumar et al. (2022), granting employees autonomy in their work leads to an increased likelihood of assuming full responsibility, generating novel ideas, and implementing sustainable practises to address various difficulties.

Organisational trust:

The significance of the relationship between perceived organisational support and trust, which is considered a critical element in social exchange exchanges, is noteworthy. The organisation functions as a platform for various exchanges and transactions that are predicated on the "exchange relationship between the organisation and its employees." The establishment of trust via repeated benefit transfers between two parties has been shown to have a significant impact on individuals' performance in the workplace (Wong et al., 2011). This suggests that a strong organisation requires the establishment of trust between employees and leaders. Employees demonstrate a high level of trust in the competence of organisations and their leaders, as well as a strong belief in the organization's dedication to ensuring the success of their endeavours. According to many studies that examine the relationship between

trust and perceived organisational support (POS), a prerequisite for POS is the presence of confidence in the organisation. Researchers have shown that an individual's impression of confidence in their organisation is shaped by two key factors: their personal conviction and the level of support provided by their employer (Gilbert & Tang, 1998).

Supervisory support:

There exists a strong correlation between perceived organisational support and supervisory support, as shown by Kalidass and Bahron's study in 2015. Establishing a robust and enduring communication link between a company's supervisor/leader and its workforce yields mutual advantages for both the organisation and its individuals. The provision of support from a supervisor has resemblance to a social bond. Employees exhibit positive behaviours that benefit the organisation when they prioritise social connections. The provision of effective supervisor support has been identified as a valuable asset that may facilitate the successful integration of employees within an organisation (Ballinger et al., 2010). When there is a good relationship between leaders and members, employees tend to have positive and pleasant perceptions of the assistance provided by the company.

Mentoring:

Numerous studies have shown that the presence of a mentor may play a

significant role in the attainment of goals and objectives, as evidenced by the enhanced levels of job satisfaction and organisational commitment reported by mentees (Behav, 2010). According to Whitely and Coetsier (year), mentoring is seen as a constituent element of perceived organisational support. Mentoring functions as a mechanism for the transfer of information and skills from those in higher positions within an organisation to those in lower positions. The provision of a link between workers and the firm is facilitated, hence presenting opportunities for career progression at lower organisational levels. According to Whitely and Coetsier (1993), individuals perceive their respective organisations to be more supportive.

2.3.3.2 Perceived Organisational Support and Job Satisfaction

Cerci and Dumludag (2019) define job satisfaction as an emotional condition that arises from the assessment of one's work experience and position, including all relevant factors. This emotional state may be characterised as pleasant, positive, or negative. The construct referred to as POS (Eisenberger et al., 1986) pertains to the employees' subjective evaluation of the extent to which the organisation values their efforts and demonstrates concern for their overall welfare. Maan et al. (year) conducted a study that revealed a significant positive correlation between POS (Perceived Organisational Support) and work satisfaction. According to Maan et al. (2020), employees are likely to have a greater sense of psychological ownership (POS) and

therefore enhance their work satisfaction when they perceive that their involvement in organisational objectives is valued and when they are cognizant of their well-being. The rapid emergence of the COVID-19 pandemic caused significant upheaval within the educational sphere. The students were required to acclimatise themselves to the novel pedagogical approach, while the lecturers had to modify their instructional methodologies, and the educational institutions had to make changes to their existing administrative frameworks. During the first phases of the pandemic, several organisations experienced a sense of ambiguity and heightened confusion over the future. Currently, there exists a strong correlation between leadership and crises. According to scholarly discourse, the first stages of disaster preparedness include leaders' understanding and evaluation of hazards, as well as their perception of risk-taking behaviours. Leadership may exhibit reluctance to allocate resources towards risk mitigation efforts in the absence of confidence in the ability of their organisation and its personnel to endure a crisis. Additionally, this will have a detrimental impact on the overall organisational culture. The concept of mutual assistance has been discussed by Demerouti and Arnold (2022). Job satisfaction may be influenced by a variety of factors, such as compensation, benefits, working environment, and the balance between work and personal life. The nature of this experience is subjective, resulting in variations across individuals (Wangler, 2022). Since the onset of the COVID-19 epidemic in early 2020, the Chinese government

and Ministry of Education have undertaken measures to improve network infrastructure in colleges and universities, while also prioritising the expansion of online course resource libraries (Wu & Li, 2020). Based on the findings of Wu and Li's survey, it is evident that a minority of university lecturers, namely fewer than 20%, have achieved a high level of proficiency in using diverse online teaching platforms to effectively conduct live broadcasts for instructional purposes. Furthermore, the provision of comprehensive training programmes for lecturers by universities remains scarce. In their scholarly article, Wu and Li (2020) go into the topic of training. Numerous media reports in China documented instances of conflicts between professors and students, particularly during the time of heightened risk management. It was observed that lecturers often experienced emotional distress, leading to instances of weeping during live classroom sessions (Hong, 2020). Consequently, it is important for educational administrators to consistently assess the psychological and working circumstances of faculty members in order to ensure the provision of supplementary support, so fostering a heightened feeling of affiliation with the institution and ultimately enhancing job satisfaction.

2.4 Research gap

The majority of the research focuses on the features, acceptance, benefits, and drawbacks of online learning. The functionalities of numerous internet

platforms are also heavily discussed in Chinese literature. Additionally, the majority of the research examines how administration and the government have supported students when institutions are compelled to switch from conventional to online instruction beginning in 2020. Additionally, several researches have focused on the connection between organisation and lecturers' work satisfaction. However, there is hardly any literature (both in Chinese and English) on university lecturers' work satisfaction in online teaching mode since 2020 and the support given to lecturers by pertinent university departments. The changes in Chinese university lecturers' work satisfaction before and after the online teaching method (since the start of the 2020 pandemic) will thus be the main topic of this paper and following research.

3, Methodology

3.1 Research paradigm and methodology

Thomas Kuhn's idea of research paradigms has been extended by several writers, and according to Guba, Lincoln, and Sanders, there are 4-5 primary paradigms. A paradigm, according to Thomas Kuhn, is "an entire set of beliefs, values, techniques, etc., shared by the members of a particular community." Research paradigms stand for the fundamental assumptions that direct research (Kuhn, 1970). A paradigm, according to Guba and Lincoln's definition from 1994, is a systematic viewpoint that directs researchers in their

research practises and encompasses axiology, ontology, methodology, and epistemology. In 2010, Bunniss, S. and Kelly, D. provided the following definition of a research paradigm: A paradigm is a collection of beliefs and practises that a group of researchers share. It governs disciplinary research and distinguishes between ontologies, epistemologies, and methodologies as well as their contributions to the development of disciplinary knowledge (Bunniss & Diane, 2010). According to Kathryn Weaver, research paradigms serve as bridges between a discipline's knowledge needs and the systems that generate that knowledge. According to Weaver and Joanne (2006), paradigms are the prism through which significant substantive concerns in a field are seen and analysed. A collection of attitudes and presumptions about the expansion of knowledge are referred to as "research philosophy" (Saunders & Thornhill, 2019). According to Zukauskas and Andriukaitiene (2018), research philosophy is the development of research hypotheses, knowledge, and properties that are regarded as preliminary statements of reasoning. This means that different researchers may have different presumptions about the nature of truth and knowledge and how they are acquired.

3.2 Research design

In order to gather and assess a large number of surveys (102 valid questionnaires), this work employed quantitative research techniques.

Quantitative research techniques deal with measuring and analysing variables to produce findings. Research methodology is defined as the general processes taken by a researcher before beginning a research job. In order to provide answers to queries like who, how many, what, where, when, how many, and how, it entails the use of specialised statistical procedures and data analysis (Apuke, 2017). According to Aliaga and Gunderson (Aliaga & Gunderson, 2002), quantitative research methods include gathering data in numerical form and interpreting it using mathematical techniques to explain a problem or phenomena. Researchers are permitted to gather and analyse numerical data using statistical methods in quantitative analysis methods; according to Creswell (2003), quantitative research "employs investigative strategies such as experiments and surveys and collects data on predetermined instruments that produce statistical data". The process of gathering and interpreting numerical data is called quantitative research. It may be used to identify trends and averages, formulate hypotheses, examine causality, and extrapolate findings to a larger population (Bhandari, 2022).

3.3 Research participants/ setting

For the first participant screening in this investigation, a purposive sampling technique was adopted. Purposive sampling depends on the researcher's expertise and judgement, hence choosing the sample units is subjective (Guart & Barrios, 2005). In order to choose samples that will be most

beneficial for the study's objectives, researchers must utilise their knowledge and areas of study (McCombes, 2022). First of all, since the emphasis of this article and next study will be on university lecturers' work satisfaction during the pandemic, only university academics were included in the initial screening of participants. Secondly, this study was based on the fact that the results were free of bias, so efforts were made to control and avoid excessive gender gaps among participants during the investigation (for example, the number of men greatly exceeded the number of women). This questionnaire survey involved 102 participants, of which 52 were male, accounting for 51%, and 49 were female, accounting for 49%. Secondly, a survey on the age of participants found that the age group with the largest proportion was 31-40 years old, accounting for 46.1%. Finally, nearly half of those who have participated in the survey have a master's degree, accounting for 55.9%, and 17 people have a doctorate, accounting for 16.7%. (Table 1 below is an analysis chart made by SPSS Statistics based on the basic demographic questions of the questionnaire).

➔ **Frequency Table**

1, What is your gender?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	52	51.0	51.0	51.0
	female	50	49.0	49.0	100.0
	Total	102	100.0	100.0	

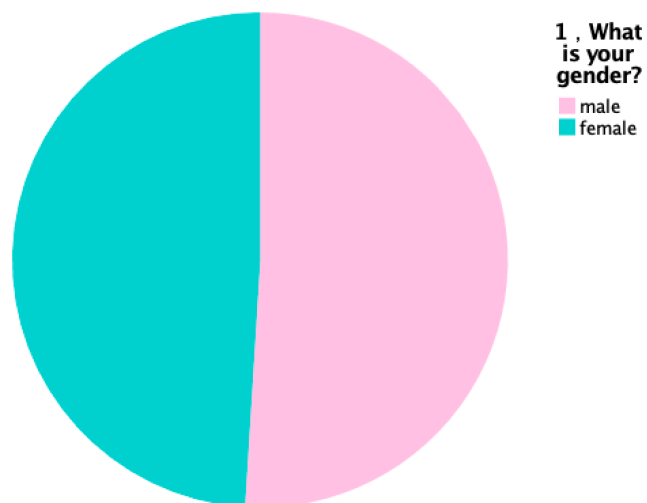
2, What is your age?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18~25	8	7.8	7.8	7.8
	26~30	18	17.6	17.6	25.5
	31~40	47	46.1	46.1	71.6
	41~50	17	16.7	16.7	88.2
	51~60	8	7.8	7.8	96.1
	60 above	4	3.9	3.9	100.0
	Total	102	100.0	100.0	

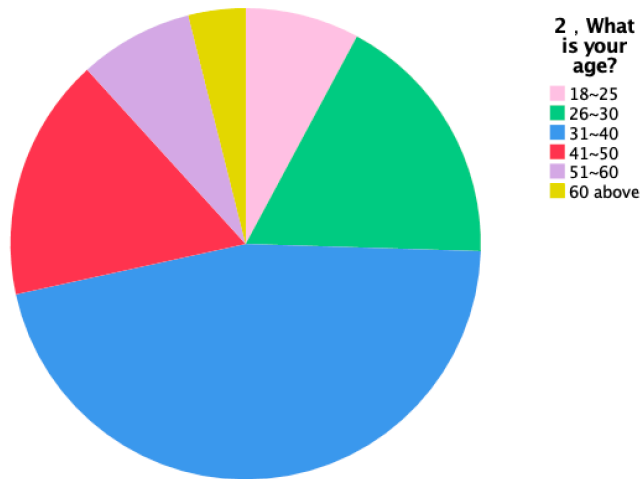
3, What is your level of educational

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Vocational college	7	6.9	6.9	6.9
	undergraduate degree	21	20.6	20.6	27.5
	Master degree	57	55.9	55.9	83.3
	Doctor	17	16.7	16.7	100.0
	Total	102	100.0	100.0	

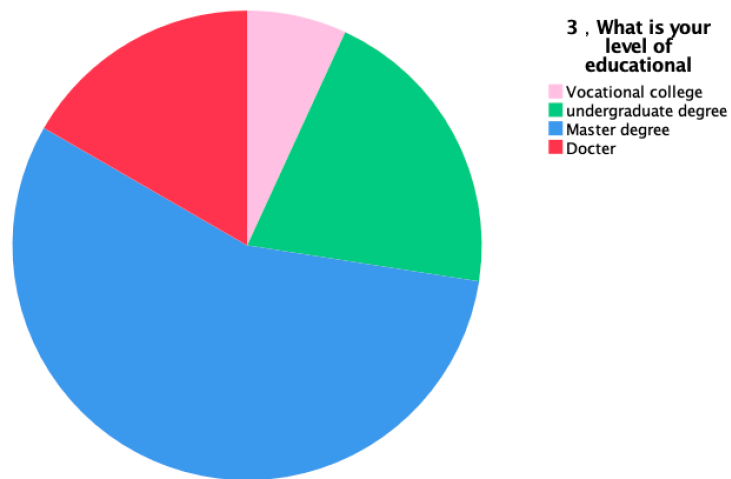
[Table 1 The demographic of the participants (n=102)]



(Pie chart 1: gender)



(pie chat 2: age)



(pie chat 3: education)

3.4 Questionnaire design

Researchers utilise questionnaires to gather data from participants throughout the study process in order to provide answers to their research questions.

When gathering data from many individuals over time, questionnaires are a particularly practical tool (68, Jenn, 2006). Designing a questionnaire means that researchers need to create valid and reliable questions that address their

research objectives, arrange the questions in a useful order, and choose appropriate administration methods. For an effective questionnaire, the topics, number of questions, and interviewer instructions are all very important parts (69, Rada, 2000). In this study, the questionnaire was designed with 15 questions, 3 of which were level questions based on personal experience, and the rest were single-choice questions. Moreover, the first three questions in the questionnaire were basic demographic questions, including age, gender, and education level. Since then, a few questions in the questionnaire have included lecturers' views on online education. Finally, the most frequently asked questions were to investigate whether universities have provided help to lecturers and to investigate whether lecturers feel pressure in online teaching since the pandemic.

3.5 Ethical considerations

Ethical considerations in quantitative research using questionnaire methods are critical to ensuring the integrity and well-being of researchers and participants. Researchers must prioritise informed consent and provide participants with clear and understandable information about the purpose of the research, their rights, and potential risks and benefits. Second, confidentiality is essential because researchers must protect participants' identities and personal information to maintain trust. Additionally, researchers must minimise harm by avoiding intrusive or distressing questions and

addressing any potential adverse psychological effects. Fair and unbiased data collection is crucial, ensuring that the questionnaire is designed to avoid leading questions or any form of manipulation. Finally, responsible use of collected data, such as secure storage and proper disposal, are important ethical considerations to protect participant privacy and confidentiality.

4 Data analysis

This study used quantitative research, and 102 valid questionnaires were distributed and collected. This study conducted data analysis after collecting questionnaires, including descriptive analysis, reliability analysis and validity analysis. SPSS Statistics software is the main statistical tool, and subsequent data analysis has been carried out at this level. In addition, this study also used the GraphPad Prism 10 software to draw corresponding pictures according to the data analysis results.

4.1 Descriptive statistics

The features and range of values in one or more datasets are summarised in descriptive statistics. The central tendency and dispersion of values in a data collection may be rapidly understood by researchers using traditional descriptive statistics, which is helpful for comprehending and contrasting data distributions (Lee, 2020). Mean, median, and mode are commonly used measures of central tendency (Gudivada, 2017). There are three main types

of descriptive statistics: distribution (focuses on frequency), central tendency (focuses on the averages), and variability (standard deviation).

This study presents an aggregation table made by SPSS software (see Table 2 below). The dark part on the left side of the chart is divided into two parts according to gender and is the sum of 102 points of valid data, as well as Mean, Median, Standard Deviation, and number in Descriptive statistics analysis; At the top of the chart are the four questions in the questionnaire that most affect the job satisfaction of lecturers. In addition, this study also presents a more intuitive graph based on this set of data. Moreover, according to the questionnaire data: 1- very satisfied; 2- satisfied; 3- normal; 4- dissatisfied; 5- very dissatisfied.

		4. How satisfied was you with online teaching overall?	8, What do you think of the resource support for online learning?	9, Do you think the online teaching mode is reasonable for your work arrangement?	13, Does the university have a department concerned with your physical and mental health?
male	Mean	2.13	2.23	2.35	1.27
	Median	2.00	2.00	2.00	1.00
	Std. Deviation	.768	1.078	1.118	.448
	N	52	52	52	52
female	Mean	2.24	2.38	2.42	1.40
	Median	2.00	2.00	2.00	1.00
	Std. Deviation	1.205	1.244	1.247	.495
	N	50	50	50	50
Total	Mean	2.19	2.30	2.38	1.33
	Median	2.00	2.00	2.00	1.00
	Std. Deviation	1.002	1.159	1.178	.474
	N	102	102	102	102

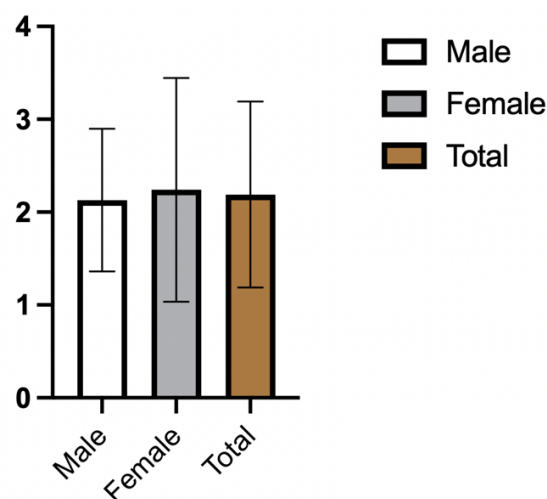
(Table 2: Descriptive statistics based on 4 main questions)

First of all, for question 4 (How satisfied was you with online teaching overall?), overall, the average value is 2.19, which shows that the 102

participants generally have high job satisfaction with online teaching.

However, the average for women is slightly higher than for men, suggesting that female lecturers have had slightly lower job satisfaction than male lecturers during the pandemic. Moreover, comparing the standard deviation data between men and women, the SD value of male lecturers is lower than that of female lecturers, which means that there are participants among female lecturers who may have lower than average situation of job satisfaction or higher than average situations of job satisfaction. Job Satisfaction. The standard deviation histogram 1 below more clearly displays the data for question 4 for male lecturers, female lecturers, and overall participants.

How satisfied was you with online teaching overall?



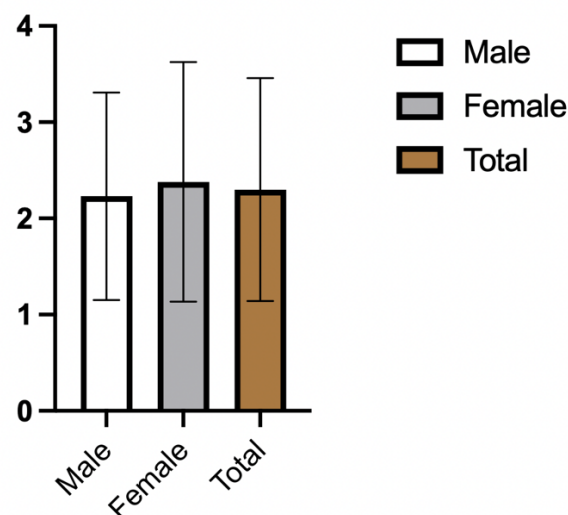
(The standard deviation histogram 1)

Secondly, for question 8 in the questionnaire, the overall mean value is 2.30, which shows that the 102 participants generally believe that the university has

given them sufficient teaching help. However, some of them may not feel that there is a significant change in the support provided by the university.

Because the value is close to 3 (normal), female lecturers on average believe that they have received less help from teaching resources than male lecturers. For this aspect, the standard deviation data is greater than one for both men and women, which shows that there is a similar controversy here. The standard deviation histogram 2 below more clearly displays the data for question 8 among male lecturers, female lecturers, and overall participants.

What do you think of the resource support for online teaching?

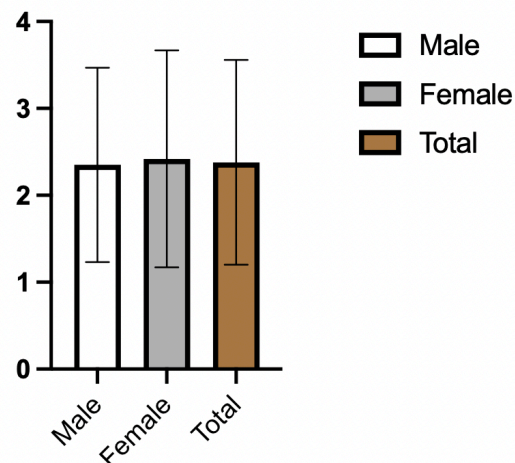


(The standard deviation histogram 2)

Third, for question 9 in the questionnaire, the overall mean value is 2.38, and the mean values for both men and women are higher than the first two questions, which means that all participants cannot feel that the university provides sufficient support on this issue. Regarding the standard deviation, the value of female lecturers is slightly higher than that of male lecturers,

which proves that some female lecturers think that the university's work arrangements for her are unreasonable or very reasonable. This standard deviation histogram 3 more clearly displays the data for question 9 for male lecturers, female lecturers, and overall participants.

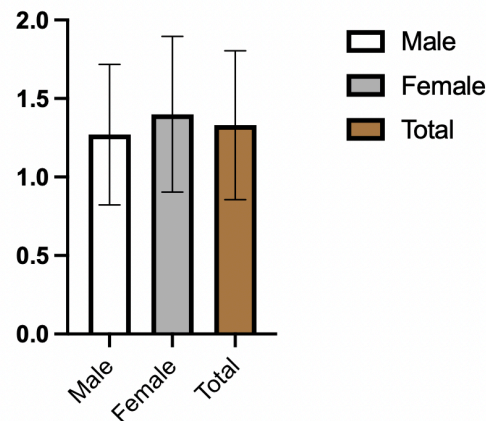
Do you think the online teaching mode was resonable for your work arrangement?



(The standard deviation histogram 3)

Finally, for question 13, the overall mean is 1.33, which shows that all participants generally believe that the university pays great attention to their physical and mental health during the pandemic. Looking at the mean values of male lecturers and female lecturers separately, are 1.27 and 1.40, both below 2, which once again confirms the view that the university has given sufficient attention to all participants. According to the value of the standard deviation, the value for both men and women is below 0.5, which again proves this point, which is very low controversy. This standard deviation histogram more clearly displays the data for question 13 for male lecturers, female lecturers, and overall participants.

Does the university have a department concerned with your physical and mental health?



(The standard deviation histogram 4)

4.2 Reliability analysis

Reliability in statistical terms can be thought of as the degree of dependence on the accuracy of a measurement or calculation result. In research, it refers specifically to the consistency of a study or test measure (Middleton, 2022). This part not only shows the results of reliability analysis (Cronbach's alpha) but also shows the Scale if item deleted (A). Reliability is a number that exists between 0 and 1. The closer its value is to 1, the higher the reliability. The purpose of displaying the scale if an item is deleted (A) is to more clearly discover which question in the questionnaire is unreasonable, which will lead to a decrease in the overall consistency of the questionnaire. The test method is when the value of a certain Cronbach's Alpha if the item Deleted is greater than the value of Cronbach's Alpha. Therefore, researchers need to consider deleting the unreasonable questions when modifying the questionnaire in the future. It is important that fill-in-the-blank questions and demographic

questions cannot participate in the calculation of validity.

The figure below (table 3) shows three types of data at the same time, including Reliability Statistics, Item-Total Statistics and Cronbach's Alpha if Item Deleted. There was a total of 15 questions in the questionnaire of this study, of which 8 were eligible for calculation of reliability statistics. Moreover, based on the calculation of the reliability of these 8 questions, Cronbach's Alpha result is 0.779. This means that the reliability of the questionnaire in this study can be considered "good", and the consistency of the questions in the questionnaire is within a normal range. Since the questionnaire questions in this study did not clearly distinguish between different sections or types, they were put together when calculating reliability.

Moreover, when observing Cronbach's Alpha if Item Deleted, only after deleting questions 10 and 12, the value of Alpha is higher than Cronbach's Alpha in the overall reliability. This means that questions 10 and 12 need to be improved or deleted in subsequent research, with the purpose of maintaining and improving the consistency of the entire questionnaire.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.779	.760	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
4. How satisfied was you with online teaching overall?	16.51	21.361	.851	.837	.696
5. How difficult do you think online teaching was?	16.27	22.696	.516	.437	.749
6. How do you think online teaching has affected your own teaching level?	16.19	22.490	.514	.297	.750
7. What do you think of the interactive nature of online teaching?	16.40	22.045	.681	.601	.720
8. What do you think of the resource support for online learning?	16.39	22.082	.627	.523	.729
9. Do you think the online teaching mode is reasonable for your work arrangement?	16.31	21.762	.647	.580	.725
10. Do you think online teaching can replace traditional teaching methods?	16.58	28.009	.153	.123	.799
12. Do you think online teaching will become a mainstream teaching method in the future?	16.22	30.705	-.126	.037	.831

(table 3: Reliability Statistics)

In order to confirm this view again, Cronbach's Alpha in Reliability statistics was calculated again (except for questions 10 and 12), and its value increased to 0.861 (table 4). This again indicates that questions 10 and 12 need to be modified or deleted to maintain or improve the overall reliability and consistency of the questionnaire.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.861	.868	6

(table 4: Reliability Statistics except for questions 10 and 12)

4.3 Validity analysis

Reliability and validity analysis are very important in quantitative research. For a successful questionnaire, although they are always analysed together, high reliability does not mean high validity, but when the reliability data is unqualified, the validity data must also be unqualified. When using SPSS software for validity analysis, factor analysis, KMO, Bartlett's, maximum variance method (V) and the absolute value (A) of 0.5 were used.

The values of KMO and Bartlett's are shown in the table 5 image below, where KMO is 0.802 and Bartlett is 0.001. The researcher's data may benefit from factor analysis if the KMO value is near to 1.0; conversely, if the value is less than 0.50, the findings of the analysis may not be very helpful. Factor analysis may be beneficial for data from questionnaire research, according to small Bartlett significance level values (less than 0.05) (IBM, 2021).

KMO and Bartlett's Test

Kaiser–Meyer–Olkin Measure of Sampling Adequacy.		.802
Bartlett's Test of Sphericity	Approx. Chi-Square	332.541
	df	28
	Sig.	<.001

(table 5: KMO and Bartlett's Test)

Secondly, when researchers design a questionnaire (scale design) based on literature review and personal experience or the dimensions of the scale itself are unknown, and researchers need to explore which questions are of a dimension, exploratory factor analysis is needed. A minimal number of hypothesised structures, also known as factors, dimensions, latent variables, composite variables, or internal qualities, are sought for by exploratory factor analysis (EFA). It just looks for common explanations for the sequence and organisation of the variables being assessed (Watkins, 2018). The figure below (table 6) shows exploratory factor analysis and dimensions, which illustrates that the questionnaire (scale) of this study can be divided into two dimensions, and the cumulative value of loadings is 60.013% (when the value is >60%, indicating that this scale is reliable and valid).

Component	Initial Eigenvalues			Total Variance Explained			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.714	46.430	46.430	3.714	46.430	46.430	3.713	46.414	46.414
2	1.087	13.583	60.013	1.087	13.583	60.013	1.088	13.598	60.013
3	.983	12.293	72.305						
4	.650	8.129	80.434						
5	.603	7.532	87.966						
6	.454	5.681	93.647						
7	.388	4.847	98.494						
8	.120	1.506	100.000						

Extraction Method: Principal Component Analysis.

(table 6: EFA and Dimensions)

The figure below (table 7) shows the dimensions and validity data of the questionnaire. It is known that they can be divided into 2 dimensions, and if the significance value of a certain question is < 0.5 , then the validity of this question is considered unqualified. If the significance value of a question is > 0.5 , then the validity of the question is considered qualified. Except for question 12, all values are greater than 0.5, which shows that the validity of these questions can be considered qualified. But for the last question 12, it can neither be classified as component 1 nor component 2, which means that the validity of this question is invalid. Therefore, in subsequent research, researchers should modify or delete question 12.

Rotated Component Matrix^a

	Component	
	1	2
4. How satisfied was you with online teaching overall?	.937	
7, What do you think of the interactive nature of online teaching?	.812	
9, Do you think the online teaching mode is reasonable for your work arrangement?	.786	
8, What do you think of the resource support for online learning?	.760	
5. How difficult do you think online teaching was?	.687	
6, How do you think online teaching has affected your own teaching level?	.660	
10, Do you think online teaching can replace traditional teaching methods?		.888
12. Do you think online teaching will become a mainstream teaching method in the future?		

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

(table 7: Rotated Component)

4.4 Linear Regression Analysis

Linear regression plots determine the strength and characteristics of the relationship between a dependent variable and a series of independent variables (Beers, 2023). According to the questions in the questionnaire of this study, the dependent variable (D) is 'How satisfied were you with online teaching overall?', because the purpose of this study is to explore the job satisfaction of university lecturers with online teaching during the pandemic. There are 4 independent variables (B): 'What do you think of the resource

support for online learning?', 'Do you think the online teaching mode was reasonable for your work arrangement?', 'Does the university have a department concerned with your physical and mental health?', and 'What is the degree of concern given in different forms by the relevant departments of the university? (Bonus/sympathy/help to improve the working environment, etc.)'. Because these questions all involve factors that affect lecturers' job satisfaction.

The figure below (table 8) shows the model summary, where the researchers focused on the value of R Square, which is 67.6%. In essence, this study's four independent factors have a 67.6% degree of effect on the dependent variables, which means they have a 67.6% degree of influence over university lecturers' total work satisfaction during online teaching. This indicates that the level of total work satisfaction of lecturers is significantly influenced by the assistance offered to them by the university as a provider, including teaching resources, well-being, health, etc. Second, the R Square value of 67.6% further demonstrates the extremely significant correlation between the independent and dependent variables.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.822 ^a	.676	.662	.582

- a. Predictors: (Constant), 15, What is the degree of concern given in different forms by the relevant departments of the university? (Bonus/sympathy/help to improve the working environment, etc.), 13, Does the university have a department concerned with your physical and mental health?, 9, Do you think the online teaching mode is reasonable for your work arrangement?, 8, What do you think of the resource support for online learning?

(table 8: Linear Regression model summary)

Furthermore, the following figure (table 9) is an ANOVA table, whose purpose is to investigate whether the existence of the regression equation is meaningful. When researchers want to test specific hypotheses, ANOVA can be used for analysis. In addition, researchers can learn how the mean of each independent variable differs from the other independent variables, how much each is related to the dependent variable, and can learn what drives the dependent variable more. When significance value(P) = 0.000 and < 0.05 , it means that this regression equation is meaningful (IBM, 2021). The P value of this study is < 0.001 , which means that at least one of the four independent variables can directly affect the dependent variable.

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.560	4	17.140	50.532	<.001 ^b
	Residual	32.901	97	.339		
	Total	101.461	101			

a. Dependent Variable: 4. How satisfied was you with online teaching overall?

b. Predictors: (Constant), 15, What is the degree of concern given in different forms by the relevant departments of the university? (Bonus/sympathy/help to improve the working environment, etc.), 13, Does the university have a department concerned with your physical and mental health?, 9, Do you think the online teaching mode is reasonable for your work arrangement?, 8, What do you think of the resource support for online learning?

(table 9: ANOVA)

Secondly, after proving that there is a strong relationship between the independent variable and the dependent variable in this study, the researcher needs to identify which independent variable directly and significantly affects the dependent variable ($P < 0.05$). The figure below (table 10) shows the Coefficients. Of the four independent variables, only the p-values of questions 8 and 9 are less than 0.05, but the P p-values for questions 13 and 15 are much higher than 0.05. This indicates that the 8th and 9th independent variables directly and significantly affect the job satisfaction of lecturers (dependent variables). The regression slope (Unstandardized B) proved whether the independent variable positively affected the dependent variable. The regression slope values of the eighth and ninth independent variables are both positive, indicating that these two independent variables positively affect the dependent variable. To put it simply, the more teaching resources the university provides to lecturers, the more positive impact it will have on lecturers' job satisfaction. Moreover, when the university reasonably arranges

lecturers' work schedules, the lecturers will have higher job satisfaction.

Coefficients ^a								
Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	.340	.326		1.045	.299		
	8, What do you think of the resource support for online learning?	.320	.059	.369	5.404	<.001	.716	1.397
	9, Do you think the online teaching mode is reasonable for your work arrangement?	.471	.058	.554	8.182	<.001	.729	1.371
	13, Does the university have a department concerned with your physical and mental health?	.093	.123	.044	.759	.450	.991	1.010
	15, What is the degree of concern given in different forms by the relevant departments of the university? (Bonus/sympathy/help to improve the working environment, etc.)	-.016	.025	-.039	-.655	.514	.951	1.052

(table 10: Coefficients)

5 Findings

Perceived organisational support theory, which focuses on how workers see an organisation rather than how an organisation sees itself, serves as the theoretical foundation for this essay. In a nutshell, POS refers to the assistance that workers get from all facets of the organisation. workers and companies also engage in some kind of reciprocity. As for university lecturers, when they can fully feel that their organisation provides support including teaching resources, bonuses and well-being concerns, lecturers will give more attention to the university as an exchange relationship. According to the results of this questionnaire, the 102 participants have a high degree of job satisfaction with their online teaching during the pandemic. Especially when they feel supported by the university to give them adequate online teaching

resources, and when they can be treated equally (work arrangement), a high level of POS is generated. In exchange, lecturers are more engaged in their work when these two conditions are met. However, according to the results, the university did not pay enough attention to the health of lecturers, both physical and mental health. Lecturers have a low POS in this area, which means that the lack of this area is likely to lead lecturers to reduce their job satisfaction, especially in high-pressure environments. The majority of lecturers, according to the findings of the questionnaire poll, feel that conventional face-to-face instruction is still the norm and cannot be supplanted by online instruction in the future. Regarding job stress, the clear majority of lecturers reported experiencing it more during the pandemic while they were teaching online. This further demonstrates why the great majority of professors hold the view that conventional classroom instruction cannot be replaced by online instruction.

6, Reflection

For this quantitative research, there are a few problems in this questionnaire through SPSS statistics and calculation. For example, the questions in this questionnaire are dispersive and not classified according to different dimensions. The multiple choices in the questionnaire were also very random and were not designed according to certain criteria. Secondly, according to the calculation of SPSS, some questions need to be modified or deleted in the

subsequent research, which again proves that the design of this questionnaire is not very successful. Moreover, the questionnaire lacks questions about the current situation, which lacks the analysis and comparison between the current situation and the pandemic period. In the next quantitative research, participants can also be classified and analysed according to their age groups, not only for men and women. Finally, different lecturers teach different subjects, including compulsory courses, optional courses, language courses, life knowledge courses, and even some courses about hobbies. However, it has not been reflected in this questionnaire survey, so this aspect should be more comprehensively reflected in the questionnaire in future research.

7 Conclusion

This quantitative study uses GraphPad Prism 10 for mapping, SPSS statistics and computations, the creation of questionnaires, and the gathering of 102 valid data. This study aims to examine university lecturers' employment satisfaction throughout the pandemic era (starting in 2020). This article begins by outlining the definition of work satisfaction in broad terms. Due to the fact that work satisfaction is a subjective concept, there are several elements that might influence it. The perceived organisational support hypothesis is the theoretical foundation for this essay. Instead than focusing on what the company has offered, POS gives researchers a fresh viewpoint on the assistance and support given by the organisation from the standpoint of the

employee. Additionally, SPSS was used for data integration, statistics, and calculations. Analyses included descriptive statistics, analyses of reliability and validity, and analyses of linear regression. Through the study, this article also offered some closing remarks, identified several questionnaire questions, and created a sort.

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