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Legal Technology and Legal Education in China

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Abstract

Legal technology, otherwise known as legaltech, refers to the use of innovative technologies within the legal system with the aim of enhancing accuracy, efficiency, effectiveness and competence. A notable example of this is the use of artificial intelligence (AI) in judicial decision-making. Legaltech is an evolving field that impacts all stakeholders within the legal system, including but not limited to lawyers, judges, technologists, policymakers and clients. It has also transformed the rule of law, particularly the justice system. Despite this, legal education in many jurisdictions has not been reformed to meet the new demands of legaltech, such as teaching skills and training people with a combination of science, technology and law. Although legaltech is well-established in China, there are only about 20 universities that offer legaltech courses, mainly for graduate students, and there are almost no training programmes for lawyers and judges. This article examines China's legaltech education and finds that the established legal education system needs to make substantial adjustments to legaltech education and training to provide more legaltech human capital. At present, it is important for higher education to incorporate legaltech into their undergraduate courses. This strategic initiative is crucial in addressing the pervasive shortage of legaltech professionals.

Keywords

Legaltech, Artificial Intelligence, Blockchain, Big Data, Legal Education, Undergraduate Education, China

1. Introduction

The last decade has seen the emergence of a large number of new technologies that have brought about changes in the development of human society. Among them, the emergence of certain technologies has led to significant changes in the legal services market, the rule of law and legal education. Advanced technologies, including the internet, big data, AI, blockchain, cloud computing and other such

technologies, have begun to be applied in large numbers to economic activities, judicial trials, legal research, legal services and legal education. This has had a significant impact on the way many industries operate, and more and more industries are now turning to use legaltech to streamline their operations, because it can often be done better or more efficiently. Legal education benefits from legaltech, and legaltech education feeds back into legal education by improving the quality of teaching. However, the acceptance and application of legaltech by all walks of life has led to a striking phenomenon—a shortage of legaltech professionals (Michele Pistone, 2015). Especially after the COVID-19 epidemic in 2020, the majority of economic activities and legal education worldwide are now dependent on legaltech. Consequently, there has been a significant increase in demand for legaltech professionals. The demand for hybrid experts combining legal and technical expertise will continue to grow: Legal AI technologies require extensive collaboration between specialists with both legal and technical backgrounds over extended periods. This suggests that legal education should consider making adjustments to provide more legaltech professionals with necessary skills to cope with this trend.

China is a pioneer in the development and application of legaltech, and as a result, the shortage of legaltech professionals is particularly acute. In 2019, the first AI judge appeared in China[1], and it is also the first AI judge in the world. Since the end of the COVID-19 epidemic, more than 20 AI judges and AI judicial assistants have emerged in China[2]. The majority of legal proceedings in China use legaltech, with more than 75 per cent of the total number of cases handled and heard by AI nationwide[3]. This requires everyone involved in the judicial process to be familiar with the basics, knowledge and functions of legaltech in order to work and interact with it. This includes a large number of judges, lawyers and other members of the judiciary, all of whom need to acquire extensive knowledge and experience during their training in law schools. In addition, the legaltech market has grown considerably, with more than 13,000 companies now in existence[4]. This phenomenon has increased the demand for personnel with the above-mentioned skills in the market and has expanded the need for legal training in the legal knowledge of technologists.

There is an apparent shortage of legaltech professionals in China, which is reflected in the shortage of legaltech researchers, applicators, and a mix of both. This paper finds that the reason for this shortage of legaltech professionals is that, in addition to the rapid development of legaltech and its wide scope of application, which makes it difficult for education to provide targeted legaltech professionals in the short term, the structural bias of legal education in China is one of the main reasons. The most important resources for legaltech education in China are only given to

[1]Efficient AI Judge Assistance.
https://kj.hangzhou.gov.cn/art/2019/9/30/art_1228922128_39583367.html.
[2]Report on Informatization Development of Chinese Courts (2018, 2019, 2020, 2021, 2022, 2023, 2024).
[3]Report on Informatization Development of Chinese Courts (2024).
[4]Law Studio. https://legalstudio.feishu.cn/wiki/Euw3wX4dNiGz8ckPWF0cJ7Kpn8b.

graduate students, not undergraduates. This structure, while protecting legaltech research to some extent, has led to a significant shortage of legaltech professionals in legaltech applications. Research professionals must not only systematically master general legal knowledge but also be well-versed in the new, complex, and challenging legal issues arising from the development and application of legal digital technologies. After introducing and analysing the development and application of legaltech in China and its requirements for the reform of Chinese legal education, this paper concludes that Chinese legal education must be adjusted to solve the phenomenon of the shortage of legaltech professionals in China. The main way is to expand legaltech education at the undergraduate level, including setting up more legaltech courses for students and providing training for current legaltech practitioners.

2. Literature Review—The Impact of Legaltech and Response from Legal Education

The shortage of professionals caused by the rapid development and application of legaltech has forced many countries and regions to reform their legal education. These reforms have mainly been carried out in countries where legaltech or legal education is more developed, and some positive results have been achieved, which can provide legaltech professionals on a continuous basis. However, the situation in each country is different, and the reform measures taken are also different.

The development of legaltech has had a huge impact on the rule of law, legal education and the legal profession. Legaltech uses technological innovations to improve remote access to legal education, and enhance cognition; and its adoption in the rule of law and the legal profession improves the accuracy and efficiency of operations. Virtual simulation classrooms are a key example of the combination of legal education and legaltech. The use of virtual reality (VR) and augmented reality (AR) in law courses "enables the superimposition of digital content onto the real world", providing students with "interactive, context-rich learning experiences" (Stalheim & Somby, 2024) that "foster deeper engagement and improve learner achievement across a range of subjects" (Stalheim & Somby, 2024; Baturay & Çelik, 2024). The VR law course in American law schools has had positive results (Volokh & Mark, 2017), especially in the legal clinic[5]. In general, the virtual simulation classroom: 1) improves the resource utilisation rate. VR virtual simulation experiments virtualize real people and legal scenes, making up for the lack of human resources. 2) deepens students' understanding of theoretical knowledge. Therefore, many countries and regions have VR law courses (van Dongen, 2024)[6].

Artificial intelligence, together with big data technology and even blockchain technology, is being widely used in many fields, including legal education. Its use in

[5]Using Collaborative Learning and Virtual Reality to Co-create a Legal Clinics Metaverse. https://www.aals.org/sections/list/technology-law-and-legal-education/using-collaborative-learning-and-virtual-reality-to-co-create-a-legal-clinics-metaverse/.

[6]University of Oklahoma, Penn State University. https://www.abajournal.com/magazine/article/virtual_reality_augments_law_school_curricula. University of Groningen, Free University Amsterdam and Utrecht University).

education is due to both the increased demand for human resources as a result of the widespread use of this technology, and the development of legal education. AI in education is a relatively mature application in the legal industry. In developed countries, relying on AI for legislation, law enforcement, and justice is relatively mature, and the logic behind it is that the working principle of AI is to learn and simulate the accumulation of human knowledge and thinking when making decisions to complete the work. Taking the example of AI judicial decision-making, the AI learns all the similar judgments in the jurisprudence database and then uses them to make a judgment, which has so far achieved the same judgment in the same case and different judgments in the same case[7]. Artificial intelligence judicial decision-making has surpassed human work in both efficiency and accuracy, and some of China's AI judicial decision-making has achieved an accuracy rate of over 98%. This is because human memory and experience can hardly compete with the joint application of AI and big data. For this reason, many legal service companies have started to use legal AI to provide services, which has led to a shortage of legal AI experts and the establishment of relevant educational programmes in law schools.

For this reason, many countries have begun to pay attention to, and establish legal AI courses to educate more students, both for reasons of international industrial competition and for reasons of educational development. Yale Law School convened a course entitled "Artificial Intelligence, the Legal Profession, and Procedure" in the spring semester of 2023. A Yale lecturer said, "AI has already changed the practice of law," and "It's changing the structure of the legal profession, the procedures followed by the courts, and forms of adjudication. Our students understand they're going to be living with this, so part of our agenda is to get them thinking intellectually about the intersection among AI, the legal profession, and rules of procedure."[8] In the EU, there are a number of universities that have established legal education programmes on AI. Among them, the European Master in Law, Data and Artificial Intelligence (EMILDAI) has been developed as a famous educational response to the legal, technical and ethical challenges of digitisation. EMILDAI helps produce legal and technical professionals with solid expertise in data protection, data governance, cybersecurity, AI law, and ethics[9]. Although China's legal education has made great progress through a series of reform measures, it still cannot fully meet the requirement of providing more legaltech professionals.

3. Materials & Methods—The Fact and Impact of Legaltech on Chinese Legal Education

3.1. Developments

Legaltech has been developed and applied in China at an earlier stage, and its impact on the economy and society has kept pace with international practice; the

[7]Application of Artificial Intelligence Technology in Adjudication. https://www.chinacourt.org/article/detail/2023/08/id/7456492.shtml.
[8]AI and the Possibilities for the Legal Profession—and Legal Education. https://law.yale.edu/yls-today/news/ai-and-possibilities-legal-profession-and-legal-education.
[9]The European Master in Law, Data and Artificial Intelligence (EMILDAI). https://emildai.eu/.

response of Chinese legal education is also in line with that of many countries internationally. However, there are some country-specific characteristics, such as the high level of development and application of legaltech in China's judiciary and legal services, and its wide range of applications, which has resulted in a particularly high demand for legaltech professionals. According to these circumstances, China's legal education has also made great adjustments in recent years, mainly including new virtual simulation law courses, AI law discipline direction, new AI law course system and so on.

The VR Law Course covers the whole process of a legal case, from the acceptance of a complaint, through the gathering and analysis of evidence, to the debates in the courtroom and the judge's final decision; as each stage is realistically recreated, students use the legal knowledge and skills they have learnt to make decisions. This deepens their understanding of substantive law and legal procedures, and exercises their legal thinking and practical skills. China's practice of virtual simulation law courses in colleges and universities is relatively late compared to some countries, but the scope of application is wider. In 2022, Xiamen University School of Law and a legaltech company jointly set up the "Online Litigation Simulation Experimental Teaching Platform", the course recreates the interface and functions of full online litigation, allowing students to participate. In the same year, Peking University and 29 other law schools cooperated to establish the "Ministry of Education's Criminal Law Course Virtual Teaching and Research Office". Tsinghua University has developed the Virtual Reality Cloud Law Teaching System (Phase 1-2) and a virtual simulation experiment programme on "Determination of Legal Liability", which are currently being implemented[10].

China's legal education sector has also established new disciplines or programmes, such as "data law", "cyber law", "computational law" and "artificial intelligence law", and other related disciplines or programmes, to adapt to the development of legaltech. In 2018, Tsinghua University Law School launched a full-time LLM programme in "computational law". In the same year, Southeast University Law School set up the discipline of "big data and internet law". Southwest University of Political Science and Law established the School of Artificial Intelligence Law, and added a secondary discipline of "artificial intelligence law"; and Shanghai University of Political Science and Law enrolled undergraduate students majoring in "artificial intelligence law". Shanghai University of Political Science and Law enrolled undergraduates majoring in "Artificial Intelligence Law"; Liaoning University established a secondary discipline of "Intellectual Property and Artificial Intelligence Law"; East China University of Political Science and Law established a master's and doctoral programme in "Intelligent Law"; and Renmin University of China established the discipline of "Data Law". In 2019, Jiangxi University of Finance and Economics added a major in data law to its undergraduate

[10]Some thoughts on how information technology has changed the teaching of legal practice. http://lilvbei.law.tsinghua.edu.cn/__local/1/04/77/C8C5FD0D9737F6560237186154A_77044211_1138E3.pdf?e=.pdf.

programme. In 2020, the People's Public Security University of China, China University of Political Science and Law and other universities established the discipline of "data law". China University of Political Science and Law established the discipline of "Intellectual Property and Artificial Intelligence Law". In 2021, Zhejiang University of Science and Technology established a major in "Data Jurisprudence"; Shanghai Jiao Tong University and Renmin University of China added a major in "Digital Jurisprudence". Shanghai University of Political Science and Law has launched an undergraduate major in "Artificial Intelligence Law" (Hu & Shu, 2024). At present, the establishment of new secondary disciplines or research directions, the establishment of new curriculum systems, new degree programmes and new specialised institutions have become the main way for China's law schools to cultivate legaltech professionals. Among them, the establishment of a new discipline is beneficial for training professionals, the new curriculum system focuses on personalised training, the new degree programmes help diversify training, and the new specialised institutions are conducive to systematic training. It helps to meet the demand for legaltech professionals (Gao & Lang, 2024).

Artificial intelligence has had a profound impact on legal education in China, not only transforming the teaching of legal knowledge, but also revolutionizing legal clinic education, which combines the teaching of legal knowledge and the practice of law. In the past decade or so, AI technology has developed rapidly, and when combined with natural language processing, big data, legal knowledge mapping, text/image/video analysis, blockchain and other technologies, it can complete AI trials with trial accuracy close to that of a judge, and become a legaltech. More and more courts in China have adopted AI to conduct trials, and its direct impact is to change the content and procedure of case trials, which requires lawyers and law students to learn the knowledge of AI trials and to obtain practical experience. The corresponding form of legal education, legal clinic education, needs to be reformed. Although the practice of introducing legal clinic education into Chinese law schools is still young, it has begun a useful exploration in the face of the rapid development of legaltech. According to the experience of Renmin University of China, digital technology has brought convenience and benefits to its Intellectual Property Law Clinic[11]; South China University of Economics and Law has also found that, in digital clinical legal education that digital teaching technology can provide new opportunities for the modernisation of clinical legal education[12]. In addition, digital clinic legal education has also spawned the research and development of legaltech education products. More and more companies have started to develop teaching software or platforms for AI legal clinic. A company called Super Star has developed a knowledge mapping technology and an AI teaching platform to support the application of digital teaching and tools

[11]2023 Seminar on New Developments in Clinic Legal Education in the Digital Age. https://law.ucass.edu.cn/info/2023/7054.htm.

[12]2024 Seminar on New Developments in Clinic Legal Education in the Digital Age. https://law.ucass.edu.cn/info/2023/7338.htm.

for clinic legal education; companies such as PKULAW and Wolters Kluwer have also developed software with AI trial functions that can be used in clinic legal education[13]. This has laid the technical foundations for the widespread establishment of AI legal clinic training across the country.

The above adjustments are the most important adjustments that China has made to legal education in response to the development and application of legaltech. The adjustments use legaltech as a teaching tool and also focus on training legaltech professionals. These adjustments are highly targeted and effective, and their most immediate effect has been to ensure the continuation of legal education, business activities, and judicial and law enforcement activities, which were not severely affected during the COVID-19 epidemic. Their long-term effect is to make legaltech and its application deeply integrated with and an integral part of business, the judiciary, law enforcement and legal education.

3.2. Imperfections

There are still some limiting factors in Chinese legal education that hinder the development of legaltech, along with legal education itself. Due to the wide and deep application of legaltech in China, there is a shortage of legaltech professionals, and Chinese legal education is currently unable to provide enough professionals. The reason is complex. First, China is a large country with a large population, and the need for legaltech professionals is greater than in other countries, which is an important reason. Second, as mentioned above, as of 2023, the number of higher education institutions offering legaltech programmes in China is less than 20, accounting for about 3 per cent of the more than 600 colleges and universities in China offering legal education, and producing a very small number of professionals. This has generally limited the number of legaltech professionals that can be trained in China, making it difficult to alleviate the shortage of legaltech professionals for some time to come.

One feature that should not be overlooked is that in all of the 3% of colleges and universities that offer legaltech programmes, the main student group or target group of their legaltech programmes is graduate students; only a few offer legaltech programmes for undergraduates. This structure of legaltech professional training is actually only able to provide professionals for the development and improvement of legaltech technologies. This cultivation structure is not reasonable because, first of all, it is possible to recruit professionals with dual backgrounds in law and science and technology at the postgraduate level, thus achieving the cultivation effect. However, there are a large number of universities in China that offer dual-degree programmes combining law and other disciplines, which can meet the conditions for cultivating legaltech professionals, so there is no reason to arrange the main courses for postgraduate education. Secondly, this structural arrangement mainly favours legaltech R&D professionals, but ignores the com-

[13]2024 Seminar on New Developments in Clinic Legal Education in the Digital Age. https://law.ucass.edu.cn/info/2023/7338.htm.

plementary role of legaltech technology application. Legaltech is an application-centred technology, which needs to change as application needs emerge and change. And this change in demand mainly comes from the application of legaltech, which also determines that legaltech application professionals and legaltech R&D professionals are equally important. The current situation of China's legaltech talents is mainly research professionals, which has led to a structural shortage of application professionals in China.

The current shortage of legal professionals in China is exacerbated by a structural shortage of legaltech professionals in China. Data tells that the main people in China's judicial and law enforcement system are lawyers and judges with a bachelor's degree, which is about 80% and 70% respectively[14]. From this, we can draw two conclusions: 1) Most Chinese universities do not teach legaltech to undergraduates. 2) Most Chinese lawyers and judges are not familiar with legaltech. These two groups are the main groups in China's legal system, but these two groups are mostly not educated in Legaltech, but in fact they are the groups that need Legaltech education the most. These two conclusions prove that the phenomenon found in this paper is correct, i.e. the lack of legaltech education for undergraduates in Chinese colleges and universities, and also the lack of training for judges and lawyers (Gao & Lang, 2024), which together deepen the shortage of legaltech professionals in China and limit the development and application of legaltech.

4. Result—Making Adjustments to China's Legaltech Education

It has been proven that both internationally and in China, we have entered the era of legaltech, and legal education should make changes to adapt to it. China's judicial system has begun to apply legaltech in a large number of cases, which has led to an increase in the demand for legaltech professionals in both the judicial system and the legal services market. As mentioned above, a number of top universities in China have already begun to reform legaltech education in their law schools, which has already yielded positive results. The established reforms in legal education are in line with the expanded application of legaltech; there is no need to change them, but rather to make appropriate adjustments to the focus or the structure of legaltech education to gradually meet the demand for legaltech application professionals.

According to China's progress in legal education, it's important to increase the number of legaltech professionals; an important direction for the reform of legal education in China is to offer legaltech courses for undergraduate law students nationwide, while maintaining or strengthening the current efforts in postgraduate legaltech education. This can greatly increase the number of legaltech application professionals and correct the irrationality in the structure of undergraduate and

[14]Ministry of Justice Releases Statistical Analysis of Lawyers, Grassroots Legal Services in FY2022. https://www.moj.gov.cn/pub/sfbgw/gwxw/xwyw/202306/t20230614_480739.html.

postgraduate cultivation. Moreover, this is also determined by the difference between the cultivation objectives of legaltech education for undergraduate and postgraduate. In terms of cultivation goals, graduate education focuses on students' participation in the process of knowledge creation. The main goal of undergraduate education is to understand and receive existing knowledge and to master basic methods and skills. The focus on application lends itself to the inclusion of legaltech courses in the curriculum, in order to develop into application-oriented legaltech professionals. In terms of courses, undergraduate students are involved in a wide range of specialisations, basically learning and applying basic knowledge in various disciplines, which is conducive to the application of legaltech. Postgraduate programmes, on the other hand, are more research-oriented, and not all of them are suitable for application. In terms of employment, postgraduate students are mainly engaged in research or in higher level training programmes, such as PhD and postdoctoral programmes. Undergraduate students, on the other hand, are mainly engaged in application work that is suitable for legaltech applications. Therefore, strengthening the education or training of legaltech teachers can create the conditions for expanding undergraduate legaltech teaching programmes, and at the same time increase the resource of research professionals.

Mitigating the shortage of legaltech professionals cannot rely solely on the education of current students, but an important direction is to strengthen the education of current legaltech applicators. As shown in the previous data, judges, prosecutors, lawyers in legal service enterprises and law school teachers are the main groups of legaltech applicators, of which around 60% - 70% are unfamiliar with legaltech[15], and strengthening legaltech education for these groups can immediately improve legaltech application. Although such training can be provided within the judiciary or legal enterprises, it is still a stopgap measure, making it difficult to provide comprehensive and in-depth training and achieve better results. Strengthening the training of these groups of people calls for a reform of the way legal education is provided in Chinese universities. In addition to the training of current employees, which can be partially provided by legaltech companies, the training of current legaltech users in colleges and universities requires attention, as their learning time is generally shorter and concentrated in their leisure time, which requires law schools to adjust their teaching methods. One of the advantages of training this group of legaltech users is that they are closely related to the application of legaltech; their training can be immediately applied to improve practice, making it the second most important way to alleviate the shortage of legaltech professionals in China.

5. Conclusion

The wider and deeper application of legaltech in China has mainly led to a shortage of legaltech professionals. In addition, the irrational structure of legaltech un-

[15]Ministry of Justice Releases Statistical Analysis of Lawyers, Grassroots Legal Services in FY2022. https://www.moj.gov.cn/pub/sfbgw/gwxw/xwyw/202306/t20230614_480739.html.

dergraduate and graduate education is an important reason. Legaltech education programmes in Chinese universities are currently insufficient and biased towards research-based legaltech professionals, with a shortage of application professionals. Therefore, legaltech programmes should be offered to undergraduate students in all or most universities that provide legal education. Training should also be provided to the current legaltech applicator community, as this is the most direct way to improve the level of legaltech applications and increase the number of application professionals. There is a global shortage of legaltech developers and applicators. For jurisdictions that also have an imbalance in the number of undergraduate and postgraduate students that provided with legaltech education (UK and other) (Aidinlis, 2024), it is necessary to learn a lesson from China's situation in order to increase the number of legaltech application professionals or achieve a balance between legaltech education for developers and for applicators.

Conflicts of Interest

There are no conflicts of interest related to this manuscript.

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