



From Restoration to Mega-Expansion: Higher Education Reform in China: A Three-Decade Review (1976-2006)

Xin Wang*

Baylor University, Waco, TX, USA

This article sets out to consider three questions: What are the principal problems confronting Chinese higher education sector? How has the landscape of higher education changed since 1978? And what are the issues need to be addressed in the future? This article examines major reforms that have transformed Chinese higher education in last three decades, including the expansion of the student enrollment, the consolidation of universities, the funding reform, the privatization of higher education, and other alternatives to higher education.

China has experienced significant economic growth during the last three decades as the country sought to make up for lost time during the Cultural Revolution. However, one of the serious obstacles to China's quest to enhance and sustain the country's economic growth is a shortage of educated personnel. To respond to this compelling need, higher education in China has undertaken reforms to expand the higher education system, restructure curriculum and programs, establish two- and three-year specialized colleges, reorganize administrative system, diverse higher education finance, and establish private institutions (Min, 1991; World Bank, 1986 & 1997). From 1980 to 2005, the number of Chinese universities and colleges rose from 675 to 1,792, with an increase in student enrollment from 0.625 million to 15.61 million (MOE, 2005). At the same time, private institutions had grown from none to 252. This article examines major reforms that have transformed Chinese higher education in last three decades. This article sets out to consider three questions: What are the principal problems confronting Chinese higher education sector? How has the landscape of higher education changed since 1978? And what are the issues need to be addressed in the future.

*Corresponding author: Assistant Professor and Associate Director Asian Studies, Baylor University,
Email: Xin_Wang@baylor.edu

Four Phases of Development

The higher education system in China, which was shattered during the ten-year Cultural Revolution, was restored in 1977 when the new leadership of the Chinese Communist Party (CCP) initiated the economic reform and set objectives for the social, economic, and educational development for China. To facilitate the nation's political and economic reform, higher education was given the top priority to educate and train large numbers of advanced specialized human resources. Universities held the first examination to admit students to receive college education after ten-year lapse of education during the Cultural Revolution. Between 1978 and 1985, China's higher education was expanded in a rapid pace. The enrollment grew from 625,319 in 1977, to 1,703,115 in 1985. By 1985, there were 1,080 institutions of higher learning, excluding institutions for continuing education, TV and Radio universities, and corporate institutions. Of these, 36 were under the direction of the State Education Commission (SEdC), 316 under the ministries of government, and 664 under provincial governments (MOE, 1985).

The second wave of reform occurred between 1985 and 1992. The old pattern of higher education administrative system and management structure was highly centralized. The central government and related provincial governments maintained excessive control over higher education financing, admission policies, instruction design, curriculum, and leadership assignment (Du, 1992). This highly centralized system of higher education impeded the development of higher education, and inhibited institutions from changing to meet social, political and economic challenges. In 1985, the central government and the CCP adopted a series of important new policies entitled 'The Decision on the Reform of the Educational System', which brought fundamental changes into the higher education system. The decision intended to "expand the powers of decision-making of the institutions of higher learning in school management ... and enable the institutions of higher learning to have the initiative and ability to meet the needs of economic and social development." These new policies delegated to universities with the authority to make decisions regarding instruction and curriculum, as well as with the freedom to set admission policies to admit students outside the state plan but financed by enterprises or by themselves. From then on, higher education institutions began to generate a certain amount of funding through private sources rather than government allocation. The new policies also proposed the implementation of a three-level education management system at the central, provincial, and municipal levels of major cities. The Decision suggested diversification in institutional types and

encouraged the establishment of more three-year specialized colleges, two-year community colleges, and adult education in addition to the normal baccalaureate institutions in order to meet the demands for different levels of skilled workforce.

The third wave of development continued after 1992 when the Chinese higher education system expanded in an unprecedented rate. Given the financing constraints in higher education in China, the central government and the SEdC, the major policy-making and planning organization for the Chinese higher education system, have launched several reforms to improve administrative system and reconfigure the structure of Chinese higher education (MOE, 1993). In 1993, in the Fourth National Conference on Higher Education, The Outline for Educational Reform and Development in China was adopted by the SEdC as new guidelines for reforms in the higher education administrative system. The Outline urges to funding sources, decentralize administrative structure and expand of university autonomy, and restructure the system for efficiency, and reasonable expansion. Meanwhile, SEdC proposed to make joint efforts with the local governments in supporting and constructing universities. In December 1994, at the National Forum on the Reform of Higher Education System, SEdc presented restructure plans for universities (Mauch, 1997). This plan is intended to implement systemic strategies rather than piecemeal solutions to change the highly centralized existing administrative system, in which universities were governed by both central government ministries and local governments. The overall system was divided into small closed systems. In such closed systems, Universities and colleges reported to different divisions of governments. They tend to be small and specialized in one area of study to prepare workforce for a specific industry. As a result, the scope of knowledge of the graduates was relatively narrow. Since colleges were confined to the specific roles defined by the needs of their affiliated governmental agencies, they were inertia to the changing environment. Meanwhile, cross-ministry intercollegiate coordination was lacking. Resources could not be shared and utilized efficiently. Furthermore, under the centralized planning system, universities and colleges had no autonomy for their own development. Institutions were unable to take initiatives to revise curricula and degree programs in response to economic and social changes in the labor market. Under restructure plans, from 1992 to 2002, about 753 colleges and universities were merged and consolidated to 285 universities. Meanwhile, universities have increased its efficiency drastically. The average enrollment of undergraduate students at baccalaureate universities was increased from 1919 in 1990 to 10454 in 2002 (MOE, 2003). The teacher-student ratio was increased from 1:6.3 in 1990 to 1:13.4 in 1999. Mega-size universities were in

the making as the result of the restructure plan. Zhejiang University, which consolidated 3 other colleges into its system in 1998, enrolled 35,000 students. The increasing number of college students partially results from the expansion plan of higher education enrollment in China. Policies which were made in the late 1980s and the beginning of 1990s delegated universities with the authority to make decisions regarding admissions. Universities began to admit a small number of self-paying students to generate an extra funding through private sources rather than government allocation. In 1987, over 25,000 employer-sponsored and self-paying students were admitted, about 2.5 percent of the total admitted students (Gao, 1988). This is only the beginning of a large-scale expansion of college enrollment. The mega expansion of Chinese universities started in January 1999 when China set a goal of achieving a gross enrollment rate of 15 percent by 2010 in the national Action Plan to Vitalize Education in the 21st Century (the Action Plan), issued by the Ministry of Education. This marks the transition from an elite and a meritocratic higher education to a mass higher education. As the result of this plan, student enrollment at universities increased from 7.8 million in 1998 to 15.61 million in 2005 (MOE, 2005), and already reached the targeted 15 percent gross enrollment rate.

From appearance, the expansion plan was made to increase access to higher education. However, this decision was intended to encourage Chinese families to spend their savings on their children's higher education to stimulate the nation's economy. At the same time, the national government could continue to reduce its public expenditures in higher education as the funding need for other public sectors were increasing. The new decision also helps China's higher education sector to establish new patterns of financing which will likely persist when government expenditures in higher educational decreased.

Meanwhile, the priority of the central government is to build a small number of the world-class universities. In 1993, the Ministry of Education announced to launch Project 211, which supports 100 key universities to become world-class universities in the twenty-first century. In 1999, the Chinese government announced a new initiative, Project 985, to support building 38 world-class research universities in China. From 1999 to 2002, the central and the local government allocated \$3 billion to strengthen research and infrastructure at these universities.

Governance

These series of reforms have had a direct impact on governance and management of higher education in China. The centralized higher education system is the product of the planned economic system. With the transition to a

market-driven economy, universities need freedom to make decision on academic affairs. Chinese higher education institutions enjoy more freedom of institutional governance today than before as academic governance has shifted from a completely centralized model to a more locally governing model since the 1990s. But in reality, government-institution relationship has been complicated in many areas. This transition delegates more responsibilities to institutions for making decisions and taking actions for their own well-being. On the other hand, as chief executive officers of universities, college presidents take more responsibilities and held accountable for the operation of the university. To many college presidents, who are often appointed by the government and the CCP, they have to learn how adapt themselves to the new administrative system.

One of the constant challenges of the Chinese higher education system is the undefined boundaries of the decision-making authority between the central government and the academic institutions. Before the economic reform of the mid 1980s, the central government had a direct influence on the management of higher education, and institutions' policies on admissions, curriculum and instruction, leadership selection, and faculty employment. In 1985, the central government and the Chinese Communist Party adopted a series of important new policies entitled "The Decision on the Reform of the Educational System", which brought fundamental changes into the higher education system. The decision stated that

The key to success in the reform of the higher education system ...is to change the management system of excessive government control over the institutions of higher learning, expand the powers of decision-making of the institutions of higher learning in school management...and enable the institutions of higher learning to have the initiative and ability to meet the needs of economic and social development (MOE, 1985).

This new policy delegated the authority to universities to make decisions regarding instruction and curriculum, admissions, and other academic and administrative affairs. It changed the role of the government in the governance of the universities, and eventually changed the government-university relationship. Though universities have gained some autonomy of academic and administrative control, the boundary of the decision-making authority between the government and the universities is vaguely defined. The central government provides specific guidelines on admissions, research and study scope, missions and objectives, and curricular structure. In terms of curriculum and instruction, national policies still have a direct control on the curriculum of graduate education. Under such uniform national guidelines, academic programs function in the similar way.

The Chinese administrative system still contains elements of the traditional division of authority between center and local provinces. Extensive government intervention is imbedded throughout higher education sector. The system emphasizes good political skills over modern management capabilities. Higher education is a public sector and receives funding from both national and provincial governments. Though universities continue to learn how to negotiate with the government to gain more autonomy and control over their own academic affairs, they are accustomed to the centralized system. They tend to depend on central planning, central funding, and central policy making. They have to learn how to share the governing responsibility with the government under the new dual governance system. This dual governing system can often be translated as less funding, more regulations and guidelines from the central and local government. Universities are held accountable and liable for institutional planning, governance and fundraising. Therefore, academic leaders need more knowledge, management skills and business acumen in order to run today's university effectively.

As more authority has been delegated to individual universities, administrative power is being strengthened within each university. This leads to a shift from government bureaucracy to institutional bureaucracy. First, there is an undefined authority of academic governance between the president and the party secretary at each university. Chinese Communist Party has its own committee at each university. During the early 1980s, the goal of the political reform was to separate Party from the administration and to clarify the functions of and relations between the two structures. Idealistically, the administration should act independently in daily administrative affairs and Party should confine itself to policy making. In reality, it is impossible to separate Party from administration. Party's political authority is much larger and higher than the administration's authority at each university since Party is in charge of key personnel appointment and promotion of the university. Presidents and senior administrators are often party members and report to the party secretary. Therefore, administration is lacking in independent authority to run the university. The "presidential responsibility system under Party's leadership" does not allow college president run the university operation independently. College presidents feel that they are sandwiched in between the government and the Party leadership since they are appointed by the government and the Party, though they are liable for the operation of the university.

Chinese academic leaders have been efficient at implementing policies and decisions made by the government and negotiating with the government in order

to receive more resources. However, college presidents need knowledge and management skills to operate modern universities effectively. When the government expenditures on higher education is shrinking, the imminent challenge for college administrators is how to raise more funding to support research and instruction.

Funding

The reforms in the early 1990s were intended to give higher education institutions more autonomy to generate their own revenues (Du, 1992). As Table 1 indicates, about 96 percent of the total budget for higher education in 1978 comes from the government appropriation. In 1992, funding for public higher education comes from multiple sources, including student tuition and fees, donations, and revenues from university's businesses. Government allocations account for 82 percent of the total budget for higher education; revenue generated from various sources by universities themselves represents fourteen percent and tuition fees accounted for four percent. The percentage of the revenue that the university receives from government has been shrinking (Table 2). In 2002, less than fifty percent of the university budget comes from government appropriations.

Table 1. Percentage Distribution of Funding from Different Sources

Source	1978	1992	2002
Total Budgeted Allocation from Govt.	95.9	81.8	50.6
Total University Funding	4.1	18.2	49.4
University Generated Revenue	4.1	12.8	21.3
Donations and others	0	0.8	1.8
Student tuition and fees	0	4.6	26.3
Total Percentage	100	100	100

Source: China Educational Statistical Yearbook, 1979, 1993, and 2003

Meanwhile, university revenue from student tuition and fees has been increasing, accounting for 26 percent of the total university funding. Universities have also been more entrepreneurial than before to generate funding from other sources to improve financial stability. Universities in China often have their own businesses and high-tech firms, especially when many technology development zones were created and built around universities. Universities often receive income from patent licensing and technology commercialization. Revenues from university's businesses and technology licensing fees have contributed around 21 percent of the total funding. One area which still accounts for a small percentage in the overall financial picture is the endowment and donation. It only contributes

less than two percent to the total funding of higher education in China. Higher education finance has already shifted from the state as the sole funding provider of higher education to a cost-sharing mechanism which includes multiple parties to share the cost of higher education. The central government has gradually reduced government financial subsidies to higher education and students. Meanwhile, universities, college students and their parents have shared the financial cost of higher education. Funds from the nongovernmental sectors have helped institutions reduce their dependence on government financing and their vulnerability to budget fluctuations, and have made institutions more responsive to market signals. The major pitfall in the process of decentralization is the disparities in financial capacity to invest higher education among provinces (World Bank, 1997).

Table 2. Revenue from Different Sources on Higher Education in China
(billion Yuan)

Year	Total Expenditure on Higher Education	Revenue Allocated from Government	Revenue Generated by Universities
1978	1.50	1.436	0.064
1992	11.04	9.030	2.01
2002	158.32	78.750	79.57

Source: China Educational Statistical Yearbook, 1979, 1993, and 2003

China is divided into three macro economic and administrative regions: the coastal region includes highly developed provinces; the central area comprised of medium-developed provinces; and the western region is a less developed region. Provinces of the coastal region can appropriate more funding from their budget than other interior provinces. Further disparities exist among provinces within the same region. Coastal provinces generally can appropriate more funding to higher education than the interior provinces can. Even within a province, disparity is evident in financial resources available for provincial universities and national universities. Universities under the jurisdiction of MOE receive more government funding than the provincial universities. Consequently, the expenditure per student for provincial universities is smaller than that for national universities in the same province. The key research universities in China are in a strong financial position. State Appropriations have leveled in last decades to these universities while dropped to many other universities; revenues from tuition, research grants have increased at an extraordinary rate. They have a large operating budget. Competition for state appropriation has been intense among top-tier universities.

Universities are dependent more upon tuition than they were two decades ago. Tuition revenue today accounts for more than 25 per cent of the typical operating budget on average. Even though sources of funds have been diversified when compared to ten years ago chart here, major sources of funding are tuition revenue and state appropriation.

Cost-sharing financial mechanism has reduced financial dependability of universities on state appropriation and increased enrollment of higher education in China. However, it has also created inequality of access to higher education as the tuition has increased from an average of \$250 per year in 1996 to \$750 per year in 2004. China's rapid economic development has accelerated the stratification of the Chinese society and the polarization and disparity between the new rich and the poor since 1990. The average income per capita in urban areas passed \$1,000 in 2005, while the average income per capita for rural families is barely \$300 (Liu et al., 1999; National Bureau of Statistics, 2006). This income disparity has created inequity of educational opportunities between regions, between rural and urban areas, and between middle and lower income families. It is almost impossible for rural families to support a student to receive university education, especially when financial aid program has not been institutionalized effectively. Urban families have more financial resources to invest in their children's education, especially middle- and upper-income families. They can afford to send their children to college preparatory programs and private universities.

Adult Learning and Continuing Education

Another fast growing sector in Chinese higher education is adult and continuing education to accommodate an increasing demand of higher education. Adult and continuing education is a part of Chinese efforts to establish community education in higher education system. Since 1978, Chinese educators have discussed establishing community education with "Chinese characteristics." The State Education Commission signed agreements with several foreign educational agencies to seek aid and understanding of community education. Chinese educators visited American community, junior and technical colleges, Australian technical and further education (TAFE) colleges, and German vocational colleges in order to develop its own version of community colleges. China has developed its own system for adult and continuing education, which includes radio and TV universities, colleges of adult education within universities, technical and vocational colleges. The total enrollment at adult and continuing education institutions is around 4.36 million in 2005. These institutions provide opportunities for students who are unable to get into

baccalaureate universities to pursue their higher education. At the same time, adult learning institutions relieve universities from the pressure for an increasing demand for higher education.

China also established two- or three-year colleges as commuter colleges to provide higher education for students in surrounding areas. These institutions are equivalent to community colleges. They are regional and provincial universities since they receive funding mainly from provinces, cities, or government agencies. They evolved as residential colleges in the 1990s as they started recruiting students from farther areas. They emphasize profession training and prepare students to enter a work force after two or three years of study. Students are usually not able to transfer to a baccalaureate university to continue their study since no articulation is established with baccalaureate universities for transfer. However, these institutions provide an alternative channel for students to receive higher education under such an elite system and meritocratic system. As universities expand their enrollments and start charging tuition to students, two- to three-year colleges face serious challenges from baccalaureate universities. Students prefer four-year universities to two- or three-year colleges since they have more career choices, and better economic return to their college education. Especially when job market is becoming competitive and college tuition is increasing. To accommodate student's needs and to survive in the market place for higher education, some two- to three-year colleges transformed themselves into baccalaureate universities. Some have been consolidated and merged by other universities in vicinity since the mid 1990s when universities were anxious to become mega comprehensive universities. In 1998 471 two- to three- year colleges existed, but only 149 left in 2003 after aggressive consolidation and merger among universities and colleges in China. When public two- and three-year colleges become baccalaureate universities, private universities emerged and took their place in providing community education.

Private Universities

As public universities have undergone expansion and consolidation, private universities have resurged in the last two decades. Private universities which established by missionaries and Chinese entrepreneurs and educators were closed or transformed into public universities after the Communist Party took power in 1949. For example, Furen University, one of the most famous private universities in Beijing built by the Jesuit, was transformed to become part of Beijing Normal University.

In post-Mao era, with the economic reform and the expansion of higher education system, universities were facing growing demand for higher education.

Public universities have limited capacity to admit students. As household income and purchasing power of consumers increase in China, private education became a logical solution to the growing market for higher education. In 1993, Chinese government published Provisional Regulations on the Non-State Higher Educational Sectors to allow private sectors to establish and operate Minban schools. In 2005, about 225 private universities were accredited by the Government with a total enrollment of one million students.

Private universities are facing many challenges. First, private universities are short of permanent faculty members. Professors prefer working for public universities to private ones. Private universities depend heavily on retired and part-time faculty members. At some private universities, eighty percent of their faculty members teach part-time. Such instability of teaching faculty makes it difficult for new private universities to create their own academic culture. At the same time, research at these universities is void since no research faculty wants to come to work for private universities in China. Private universities are generally established in large cities and college towns to share resources from public universities, including faculty. For example, twenty-two private universities are in Xi'an at present, a city with more than forty-five public universities. To public universities, private universities have not posed any fierce competition to them yet since the majority of Chinese students still choose to go to public universities, whose degrees are well recognized and academic programs are diverse and broad. Public universities recruit top forty to fifty percent of high school graduates. Private universities can only recruit students after admissions of public universities. To students who are not admitted by public universities, private university is the second choice to receive higher education. Academic programs are still limited at private universities. Most of programs are professional studies, such as English training, business and computer science. It is rare to have academic programs in humanities and sciences at private universities, which require more investment in lab research. Curricula at these universities are pragmatic. Most programs are two to three years long.

Private universities are still new in China and the central government has published several regulatory documents to enhance private higher education, including the 1995 Provisional Regulations on Education Institutions Jointly Sponsored with International Institutions, the 1995 Education Law, the 1996 Vocational Education Law, the 1997 Regulations for the Non-State Education Sector, and the 1998 Higher Education Law. Private universities have also been working with the government for accreditation and improving education quality.

Private training schools are thriving in China. These schools provide language training, test preparation, business training and technology training to all age groups. Students at all levels attend year-round after-school training programs. Self-potential and ability development programs are also popular among the newly emerged middle-income class and white-collar professionals. Recent college graduates will also pay to improve their English or business skills, as they believe that they must do so in order to get promoted or find a higher paying job. In a recent survey conducted by China Market Research Group, the result shows that in Shanghai over fifteen percent of recent graduates are willing to spend over ten percent of their monthly disposable incomes on training courses (Rein). One successful school in English training business is New Oriental Education. Founded in 1993, the company has since built a strong brand name for its foreign language and test preparation courses for GRE, GMAT and TOEFL. Foreign language training and test preparation courses are the main growth drivers for the company. As China is plugged into the global market, the demand for English training is increasing. Its primary market is the college students who plan to study abroad. Since 2002, more than 100,000 Chinese students have traveled abroad to pursue degrees each year. The company has also developed English training programs for adults and children lately since there has been burgeoning demand for English training. It has an extensive network in large cities. It currently operates 25 schools and 111 learning centers in 24 cities with an enrollment of 900,000 students. It has successfully developed a distinguished brand name among Chinese college students. It is now publicly traded at New York Stock Exchange.

Privatization of higher education has also increased the issue of inequality in access to higher education. Private training schools are booming only in large cities. Smaller cities have fewer English-speaking candidates and qualified teachers. In addition, like private universities, training schools primarily focus on foreign language training or business training. Curriculum is lack of diversity. But the demand for training is growing among adults and college graduates.

Conclusion

This article has described the challenges to which the Chinese universities and government must respond in order to create the conditions under which continued improvement and transformation can occur. With the introduction of student tuition payment and private institutions, Chinese higher education has been privatized and decentralized. The system is shifting from a meritocratic education to mass education. However, government is still the dominant force in Chinese higher education. Government directs the development, structure,

instruction and research of higher education through its funding and policymaking mechanism. Recent reforms in higher education have accelerated the polarization of the universities. With a substantial financial support from the central government, a group of research universities are emerging. These universities can afford to attract top researchers and scholars to teach and conduct research. The disparity in government funding between research universities and other universities is increasing and has created elitism in Chinese higher education system. Research universities have more elite status than other institutions do. Smaller colleges, who depend on local funding and tuition, have been consolidated into large universities. At the same time, private colleges are emerging and become active regional player in technical and vocational education. Thus, a multi-layered higher education system is in the forming. Universities have already started tapping financial resources from private sectors. Students, businesses and private donors, along with government, share the cost of higher education. A multi-sector cost-sharing financial mechanism of higher education is in the forming.

The introduction of student payments and rising enrollment has raised a critical question about education quality at both public and private universities. Some universities admitted more students than their capacity can handle in order to generate more financial revenue. Chinese government has not yet established new mechanisms of quality assurance for higher education. National accreditation agencies have not been established to evaluate administrative and instructional effectiveness. No evaluation procedure has been developed at both national and local levels. With the increased pace of reform and the new questioning about quality, Chinese government and universities need to develop a coherent policy that will achieve accountability for higher education.

References

- Du R: *Chinese Higher Education: A Decade of Reform and Development (1978-1988)*. New York, NY: St. Martin's Press, 1992.
- Gao S: Putong gaoxiao zhaoshou zifeisheng [Self-financed students enrollment at traditional institutions of higher learning]. *Zhongguo Gaodeng Jiaoyu [Chinese Higher Education]* 1998, 6, p. 23. Beijing, China.
- Liu G et al.: *Economics Blue Book of the People's Republic of China, 1999: Analysis and Forecast*. Armonk, NY: M. E. Sharpe, 1999.
- Mauch J: Influences of the Chinese National Academy of Educational Administration. *Annual Meeting of the Association for the Study of Higher Education (ASHE)* in 1997, Albuquerque, NM, November 4, 1997.

- Min W: Higher education finance in China: Current constraints and strategies for the 1990s. *Higher Education* 1991, 21, 151-161.
- Ministry of Education (MOE): *Educational Statistical Yearbook of China 1978*. Beijing, China: People's Education Press, 1979.
- Ministry of Education (MOE): *Achievement of Education in China*. Beijing: People's Education Press, 1985.
- Ministry of Education (MOE): *Educational Statistical Yearbook of China 1993*. Beijing, China: People's Education Press, 1994.
- Ministry of Education (MOE): *Educational Statistical Yearbook of China 1999*. Beijing, China: People's Education Press, 2000.
- Ministry of Education (MOE): *Condition of Consolidation and Merger of Higher Education Institutions since 1992*. Beijing, China
- Ministry of Education (MOE): *Educational Statistical Yearbook of China 2005*. Beijing, China: People's Education Press, 2006.
- The National Bureau of Statistics: *Statistical Yearbook of China 2005*. Beijing, China: China Statistics Press, 2006.
- Shaun R: Training China's Eager Middle Class, <http://china.seekingalpha.com/article/17279> (current 2007).
- World Bank: *China: Management and Finance of Higher Education*. Washington, DC: The World Bank, 1986.
- World Bank: *China: Higher Education Reform*. Washington, DC: The World Bank, 1997.

Opinions expressed by authors are their own and not necessarily those of ARIE journal, the editorial staff, or any member of the editorial board.