COVID 19 Turn in Higher Education

Policy Advisory Document Prepared by the State Higher Education Council for the Department of Higher Education, Government of Kerala

Abstract

This Policy Document has four parts. In the initial three parts the Chairman has drawn the background in detail, starting with a brief assessment of the COVID19 impact on the capitalist economy, a quick search for indications of an alternative economy in the wake of the pandemic health crisis, a passing remark on the feasibility of people's economy in India, and a discussion of the distinct manifestations in Kerala. This is done with a view to understanding the transformative force of the pandemic. Speculative thoughts on the vicissitudes of the capitalist economy constitute the second part, which are indispensable for having at least a tenuous idea of the nature of the global economy that would decide the nature of higher education. A historical overview of the pandemic impact on higher education and a review of the COVID19-induced changes in the sector make the third part. Following this the Committee's discussion of the contemporary challenges in the higher education field and its recommendations of preparatory measures to be adopted are given as the last part.

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Part I
COVID19 Impact on Global Economy

A contingent policy document in the context of the COVID19, it has to start with an appraisal of the transformative force and consequences of the pandemic. Would the pandemic lead to a total systemic transformation of the global economy is the question to be discussed at the outset, because the knowledge thereof is essential for any reasonable speculation of changes in the higher education sector. Many facts, figures and quantitative projections have come up assessing the gravity of post-COVID 19-downturn mostly from the angle of growth and hence obsessed with unknown threats to capital and compelling trade-offs. All of them point to the economic and social consequences of the health-crisis, globally devastating and unprecedentedly severe. Experts think that it is going to turn the world into another techno-economic culture.

Various world organizations have opined that merely repairing the damage of the dominant economy will not help anymore. It is inevitable to open up ecologically sustainable alternative development paths leading to systemic change in the economy. Adding to this, climate change-induced disasters, though hardly ever spread panic among people unlike pandemic, are going to be too serious for the planners to ignore the inevitability of the factor of ecological resilience in future development (Niklas Luhmann, 1989; Owen Jones, 2020).

COVID 19 pandemic, though devastating to the economy the world over, will have a course relatively less intense in the developed countries. Critical political economists think that COVID 19-induced downturn precludes recovery of conventional capitalist economy. Any major crisis lets philosophers spread the wings of their thoughts about the immediate future. Many reacted against the loss of individual freedom and identity in the wake the state dictating social behavior under the emergency of pandemic. Humanists imagined the passage of what they hated and extrapolate indications in the current situation to their cherished alternative based on environmental justice, social cooperation and public trust. Some of them predict this crisis transcending the centralized state power or global capitalism or barbarism would lead to a post-capitalist phase of communities, not rigidly class divided, enjoying equal status at various levels in terms of livelihood practices and relations of exchange. Even emergence of world communism itself has been predicted (Slavoj Zizek, 2020).

Such radical changes in the economy would not be due to capital fall and state-driven policies because their course is invariably bottom up and people-driven. Extensive loss of workforce and miserable conditions of human existence would push the people into survival struggles. We should, therefore, look for signs of extensive people's survival struggle, to decide whether the pandemic crisis would transform the global economic system. Then we should also search for indications of the emergence of alternative economies as a part of the struggle.

Historical Experience

Reviewing historical experience of crisis-driven survival struggles and the rise of alternative economies is helpful in understanding the present situation. A team of social scientists have shown how survival struggles of the ordinary people of US, Europe and Australia had led to the rise of alternative economies during the financial crisis of 2008 (Manuel Castells et.al 2017). Supports not forthcoming from their elitist Governments, they resorted to spontaneously evolving community practices of reciprocity and cooperation as survival strategies. Resorting to barter networks, ethical banking, digital entrepreneurship and cryptographic virtual currencies they rendered another economy based on new norms of exchange possible. Nonetheless, the market economy, back to dominance after overcoming the financial crisis, could easily contain the people's alternative. Now under the COVID19 crisis the same people are struggling to reinvent the alternative.

As happened after the financial crisis of 2008, post-pandemic recovery measures of governments caught up in transnational trade-offs will normally give top priority to doing everything to restore the global economy of capital flows. A series of new exactions like healthcare levy, salary control, wage reduction, job retrenchment and public expenditure cut besides withdrawal of compensations and welfare measures would follow. Naturally there would be people's movements desperately demanding their governments to ensure better health security, redistribute wealth, enhance consumption, boost investments,

and generate employment. Demands would certainly influence government policies a bit to provide for jobs, compensations, and better public healthcare. But there could be hardly any measures to regulate capital growth for reducing distributive injustice.

India, one of the world's largest democracies though, is going to be no exception. A developed financial set up of dynamic private sector under free market economy of macroeconomic stability, a huge domestic market, and a fairly diversified science-tech infrastructure, a commendable diaspora, valuable knowledge networks, and a developed IT sector of global software provider status; the country is largely crony-capitalist.

Representing diverse groups, relations and interests in society, the nation plays apparently the role of overall co-ordination, but as desired by the middleclass that constitutes the Government but as wanted by capitalists, who hold the strings of final control. Placed at the mercy of market, the people are integrated in hierarchies of caste-class convergence across religions and of bureaucracy under the state, semi-state and private enterprises. One fourth of the population, illiterate and poor, mostly in the villages but largely moved by sentiments rather than political consciousness, it is hard for the country to achieve grassroots democratization.

Survival struggles have been there but too subsumed and marginalized. Panchayati Raj Nagarapalika self-governance initiatives (1992-93) helped the Government accelerate market development rather than democratization, for it made little change in the local social power relations based on caste-class-community nexus. Local level self-governing institutions and cooperatives would not develop under asymmetrical social relations.

Kerala's Distinction

Kerala's distinct position deserves a discussion here. As regards decentralization initiatives Kerala is far ahead of the rest of Indian states. Kerala introduced the constitutionally ordained self-governance through People's Plan Campaign (1996), which made an exceptional difference under the Marxist Government of democratic centralism (Thomas Isaac, 2001; Michael Tharakan, 2001). It did result in institutional development at the grassroots, especially people's cooperatives providing the weaker section better access to local resources and power. People's self-governing institutions with predictable share of plan fund for local level development enterprises distinguished Kerala from other states. It enabled the state to become nationally No 1 in sustainable social development.

Kerala's COVID 19-crisis management has drawn global attention due to the Chief Minister's outstanding leadership, the health minister's intimate involvement, and the functional competency of local bodies. What the developed world finds amazing is the running thread of political control across the widespread public healthcare institutions, local bodies of self-governance, multiple cooperatives, distributive channels, charitable societies, community service organizations and other agencies guaranteeing compassionate action on

war-footing! It is coalescing different agencies of conflicting interests into a single task with absolute precedence of human values over economic gains. This distinct set up enables the state to effectively encounter the pandemic lockdown and its social consequences like livelihood loss, workers without income, farmers with unsold products, unemployment, abject poverty, starvation etc. It helps the state facilitate voluntary redistribution of wealth and circulation of essential goods without profit motives ensuring social security. This is governmental restructuring of the economy into a resilient and equitable alternative extending goods, services, and credit for people. It is at once the redesigning of a new pattern of social existence of high adaptability to stagnation as a new normal.

Indications of the alternative demonstrate that another economy is possible, but only in times of crisis, irrespective of whom renders it plausible. Diffused communities in the developed world made it possible through the spontaneously emerging institutions, groups, relations and practices as part of their survival struggle in 2008. A state like Kerala proves its feasibility by means of constitutionally ordained local self-governing bodies, cooperative institutions, and political leadership. Crisis-driven alternative economy's responses like work sharing, food security measures, basic income scheme etc., do reverse the capitalist redistributive functions. Kerala shows how the Government should evolve policies of social care-nets, strengthen public health, provide economic stimulus to local enterprises, and combine growth with equity.

All this hardly means that production, consumption and exchange not driven by motives of profit and consumerism can last beyond the days of crisis. None of these can scale up to bring about a systemic change for a variety of reasons relating to the dynamic of development (David Ruccio, 2010). Most decisive of all is the government's systemic role as economy's tool. Even in crisis, the governmental priority shall be protection of the economy of growth. Kerala's case of governmental priority to people's livelihood security, public health, educational access, and equity is an exception.

Part II
Vicissitudes of Global Economy

A reappraisal of the vicissitudes of Global of the capitalist economy is relevant here. Nobody can say that the global economy would continue without any change. It appears that the growth of global capitalism would recoup, fast using the pandemic panic and the fear of life-threatening virus, not in the same way though.

Techno-capitalism/Knowledge Economy

Studies have demonstrated the ascendancy of a mutated form of capitalism after the major financial crisis of 2008. This mutated form, driven by science and

technology as source of accumulation, is called Techno-capitalism, popularly known as knowledge economy (A. Feenberg, 1991, Luis Suarez-Villa, 2009 & 2012).

Unlike the past industrial system of manufacturing goods and services, the new type runs huge research establishments in science-tech hybrid fields for the production and exchange of intellectual property and patents – the most potential source of accumulation (Michael Perelman, 2004). Organized into corporations, techno-capitalists have built up such experimentalist research establishments the world over engaging thousands of scientists and engineers good in high power computing and software designing for the purpose. It involves appropriation of science-tech creativity from the youth for the production of patentable intellectual property. Transacting patents and intellectual property they accumulate billions of dollars. Similarly, sales and purchases of multi-media software packages help accumulate amazingly huge sums of capital. This means owning and controlling knowledge not as the basis of commodity production but as commodity itself and as the source of intellectual property, also called the intangible asset. Intangible assets account for as much as four-fifths of the total value of current products and services (Luis Suarez-villa, 2009 & 2012).

Knowledge works both as commodity and capital in the economy. Commoditization of knowledge makes creativity an independent economic entity blinding the users of knowledge from seeing the author. This is commodity fetishism turned into capital fetishism. It operates in a very complex way under the global juridical system of Intellectual Property Rights (IPR) and transnational imperialism rooted in technological sophistication and corporate militancy (Luis Suarez-villa, 2012 & 2015). Corporate laboratories are exploring the micro universe of proteins and their dynamics through X-ray crystallography, high-field NMR spectroscopy, microarray technologies and automated methods. Their researches are mostly in latest science-tech hybrid areas like genomics, biopharmacology, biomedicine, synthetic bioengineering, bioinformatics, robotics, nanotech sensors and transmitters etc. Tens of billions dollars worth intellectual property in hand and patents in the pipeline, techno-capitalists will flourish. COVID 19 crisis will only boost the accumulation. They are the wealthiest and most powerful corporations that exert unprecedented influence on contemporary world (Luis Suarez-villa, 2015).

It appears that the global economy will continue to expand its market by capitalizing the pandemic panic and fear of life-threatening viruses, not in its conventional form, but in a new form heavily depended on commoditization of technology and science for turning knowledge into capital.

Universities will have to put up academic resistance through teaching and research seeking to unveil the consequences of oligopolistic knowledge industry. They should endeavor to attract students to problems of local societies awaiting sustainable solutions. It is extremely important to develop life-related academic activities adequate to entrench our higher education institutions' social rootedness.

Part III

Post COVID19 Higher Education

A review of antecedents is useful to understand the present features better in order to generalize upon the possible features of future higher education. Pandemic crisis causing massive human resource-loss had intensified the basic contradictions in the past socio-economic relations accounting for radical systemic transformation. Needless to say that contemporary system of higher education was not immune to the process.

Antecedents

Different kinds of plague in Europe killed many of the bonded peasants and pushed the survived into emancipatory struggles during the 11th, 12th and 13th centuries causing the decline of feudalism. It was during this period of crisis, Bologna, Oxford and Paris, which had emerged as guilds of students and teachers immune to economic pressure, political control and dogmatism. Plague continued to ravage during the 14th, 15th, 16th and 17th centuries more ferociously. Despite huge loss of human life under pandemic, economic crisis, social upheavals and political battles; universities proliferated augmenting the horizon of knowledge through centuries old travail of curiosity, spirit of enquiry, criticism and adventure. All this accounted for epochal transformations such as the Renaissance, geographical discoveries, religious Reformation and industrial Revolution.

Significantly restructured and academically diversified in the wake of the pandemic lockdowns, universities and colleges boomed as centres of critical inquiries, fundamental discoveries, and path-breaking inventions. Isaac Newton's mathematical theories of macro mechanics that literally shook the world were born under a major pandemic lockdown. All this ly led to the final dissolution of the decadent feudalism into another system of socio-economic relations called capitalism, in the turn of 18th century.

A major health crisis occurred as a result of the outbreak of the smallpox pandemic in the late 19th century. It took many lives of the workforce inflicting serious damage to capitalism. Nevertheless, capitalism survived through a new organizational strategy of marketing distinguished as monopolistic and through the pharmaceutical industry depended upon the growth of medical higher education and medicinal inventions. Discoveries of Louis Pasteur, Joseph Lister, Robert Koch, and Ivanoski in the late 19th century heralded bacteriology and diagnostic laboratory tests a new turn in medicine. It was towards the end of the 19th century Beijerinck discovered (1898) virus. All this gave rise to a new treatment culture among physicians and public health workers in Europe and USA.

Spanish influenza of 1918-19 had killed about 50 – 100 million people across the globe, which exceeded what the two World Wars did in all during their course of ten years. Many associated the pandemic with the extensive movement of war troupes and their transportation the world over. Loss of life due to the contagion triggered rebellions among the working class and peasants in Germany and Ireland under the inspiration of the Russian Revolution of 1917. Peasant movements hit the colonial India where the pandemic claimed the life of 17 million people. World Wars deprived the dominant economy of the war booty and put the higher education into disarray for almost a decade. Nevertheless, science and technology advanced through researches leading to path-braking discoveries and inventions all along the periods of crisis created by the great depression of 1930 and the II World War. Ever since, industrial capitalism did encounter a series of recessions aggravated by contagions like Measles, SARS, MERS, ABOLA and AIDS. In one way or other it returned more vigorously. Higher education sector registered phenomenal expansion across the world and witnessed an unprecedented explosion of knowledge in all fields.

COVID19 Impact

COVID 19 pandemic impact is not likely to bring about any systemic change in the global economy, for it has mutated as techno-capitalism or knowledge capitalism capable of overcoming the crisis, as pointed out earlier. World higher education has already been undergoing reforms as to meet the requirements of the mutated capitalism. Hence higher education is not going to transform itself radically. Nevertheless, the reforms underway at a slow pace, would acquire a greater speed in implementation. Pandemic lockdown has helped world higher education accelerate the reforms, especially the mode of teaching and evaluation.

All over the world COVID19 situation has released a sudden spurt of demand for online teaching and learning. It has given a big impetus to online technology to generate a variety of teaching/learning tools with innovative additions. Everyday new tools and apps are coming up claiming capacity to enhance teachers' efficiency in quick mobilization and effective delivery of knowledge on the one side and students' ability to grasp on the other.

Lockdown-induced closure of higher education institutions has been compelling teachers and students in India too to resort to online mode. Two Committees instituted by the University Grants Commission (UGC) have strongly recommended extensive dependence on online for teaching, learning and evaluation. There is a national level call for *de facto* switching to the system of virtual learning, widely hailed more effective, quick and less expensive. Already the crisis has pushed an unprecedentedly huge number of teachers into a mode of teaching unfamiliar to them.

Keeping in view of the UGC Committees' recommendations, corporate need and the pandemic pressure, it appears that the higher education institutions may soon fall into two types – the Virtual and Actual. The Virtual type would cover humanities, liberal arts and social sciences. Most of these knowledge fields are going to be taught through the virtual mode, informally and less expensively

under the prejudice that they are light subjects, largely meant for the middleclass general public. On the contrary the Actual type would cover medicine, pharmacy, nursing, pure sciences, engineering, and architecture. These are serious and tough subjects to be taught formally and expensively through the campus mode.

It is evident that liberal arts, humanities and social sciences are going to be trivialized as commonsensical, because if taught seriously, they would expose the heavily exploitative and dehumanizing relations of the dominant economy. Corporates are utterly impatient of these knowledge fields, inherently critical at the deeper level, for they empower the youth to speak truth to power. Intimate learning is essential for the learner to access deeper levels of these knowledge fields, be clear about its relation to social/national development and acquire the critical dimension. Critical consciousness about social reality is what a student in liberal arts, humanities and social sciences acquires through direct interactive learning from a teacher who knows the politics of his specialization. Such serious teaching/learning ecosystems are essential for the making of good citizens capable of public policy debates and collective operations for social transformation in any democratic country.

Deeper knowledge across disciplines of liberal arts, humanities and social sciences is innately linked to questions of social equity, gender justice and environmental sustainability. Hence it is critical of capitalism, a global system of relations of production, consumption and exchange involving recklessly extravagant exploitation of natural and human resources. Scientists, social scientists, linguists, artists, literary critics and creative writers alike as organic intellectuals articulate protests against the dehumanizing and anti-environmental aspects of capitalism. A teacher of critical insights irrespective of her/his field of specialization understands capitalism and its consequences.

Online teaching and evaluation would be pushed as a new normal under the pretext of the pandemic crisis. Online delivery of lessons would not be feasible in the case of about thirty percent of students at home under lockdown wanting net connectivity. It would upset objectives of access, equity and excellence in the higher education sector. Kerala, a state of high literacy and sprawling urban growth, is no exception to the convergence of rural-urban contrast to the digital divide at the national level. Despite the country's status as a prominent IT service provider to the world, over 700 million of its people suffer from e-illiteracy. Digital divide in higher education is integral to this. Even in Kerala socio-economic backwardness and digital illiteracy converge as caste and class do. It is a fact that digital divide can deepen the already existing inequalities. Hence measures to bridge the digital divide, however difficult they are, must be adopted with top priority at the level of the university, college, local self-governing bodies, the directorate of collegiate education. Digital divide would make higher education inaccessible to students deprived of the online infrastructure and inhospitable to a large number of teachers not accustomed to the technology.

Online mode is not going to be optional due to the irresistible influence of its fast growing technological sophistication and widespread appeal to the

sensibility of the young generation. Resistance to a technology that has great acceptance among the youth is in vain. Therefore, a state like Kerala, which has the unique distinction of having consistently taken care of access and equity in the higher education sector even with privatization and commercialization in progress, cannot ignore the issue. It significantly enhances the state's responsibility to evolve ways and means to overcome the predicament. Technology would increasingly become inevitable complementary to actual teaching/learning. Hence the state, not achieved excellence as yet in the field of higher education, is committed to ensure equitable distribution of educational technology and wider accessibility. It is not accidental that Kerala is the first state in the country to declare Internet access a basic human right.

Students of eminent universities have the advantage of in-face interactive learning distinct for criticality and creativity of the campus as well as the freedom of auditing the lectures of outstanding professors in the web, which make them more competent. Web based learning helps them better personalize their academic enterprises with access to global data in the cloud. This prepares them resourceful enough to serve the knowledge society of the 21st century.

Emerging Technology

Computer, Internet and IT are three of the high indices of today's civilization, which the world would continue to rely on for long with improved speed and bandwidth. Their revolutionary role in education is undeniable. Resistance to the technology is a vain exercise.

It is predictable that the initial phase of sharing and using the old content through online used as inevitable would give way to virtual teaching and evaluation based on its tools like the course management systems (CMSs), asynchronous presentation/discussion, and videoconferencing. This would continue extensively even after the COVID19-induced social restrictions like physical distancing and lack of freedom to travel cease. Soon reusable content objects, peer-to-peer collaboration, digital libraries, e-books, and other assistive technologies of the virtual worlds would enable better online teaching and delivery of course material.

It is true that all this can provide advanced technological settings and chances of listening to the lectures of very eminent scholars like Nobel Laureates who globally matter in their fields. Fast becoming virtual content-driven, higher education of electronic sophistication would significantly cut the positive role of the politics of shared collective intelligence of the campus, social interactions, and cross-cultural exchanges. This has major consequences, especially a-politicization and mechanization of the youth that would degenerate into an apathetic mass. Online higher education is never a match to the campus mode that brings to the fore the critical aspects of knowledge.

It is true that the age-old in-face lecture mode followed in colleges and universities has democratized mediocrity. It is also true that smart teaching under electronic sophistication can render students the latest course material as

well as lectures of high profile professors including Nobel Laureates through virtual classrooms. Administering of courses online would definitely have to compromise quality unless used as a complementary alternative. However, online lessons provided by Coursera, EdX, Future Learn, Udacity, Canvas Network and many others in European languages are being used as complementary by students in great institutions famous for campus learning. Students' knowledge supplemented through online instructions by world-renowned scholars would compel the ordinary professors to be academically more challenging in their teaching. In short, virtual higher education would never match the campus based real that is distinct for various critical aspects of rigorous learning.

Possible Transformations

COVID-induced virtual mode is not just a technological alternative to the actual teaching learning system. Capable of reshaping many of the established educational practices and their environment, it would bring about a series of transformations in the concept of higher education institutions, their clientele and practices. A change in the concept of competence, outcome, teaching, learning, evaluation, quality, access, equity and excellence is likely. Competence will be e-competence, outcome computational, teaching ICT linked, evaluation online based, quality e-competency related, access technology dependent, and equity a mere rhetoric. Further, under the COVID19-induced flexibility and wide choice impairing institutional requirements and administrative procedures would make higher education much more personalised and self-directed.

Post-COVID19 changes in the campus would be mainly behavioural such as physical distancing, mask wearing, and sanitizing. These will be insisted upon in classrooms, libraries, laboratories, canteens and other places like common spaces, but more as a set of new routine. At the same time there are certain matters most likely to be followed seriously. A new time schedule, opportunities to gain work experience under the scheme of Earn While You Learn (EWYL), chances to do various courses enhancing employability, postgraduate programmes in cross-disciplinary fields, and expansion of life-related researches. Many students aiming to go abroad for higher studies would be encouraged to continue their higher studies in the state itself due to COVID 19-induced restrictions on mobility and the global recognition of Kerala's health security. Students from within the country too would like to pursue their studies in the state, thanks to its dignity of showing equal care for all. This would lead to the appointment of many new teachers in different fields.

Post pandemic higher education would be influenced by the pandemic itself. Research fields might be either directly or indirectly related to the pandemic crisis and its consequences. Scientific research will have an added focus on the knowledge universe of the virus itself. COVID19 vaccine is the object of sustained engagement the world over today. Pandemic is going to be the central theme of research in liberal arts, humanities and social sciences too, focused through the lens of disciplines, genres, and their unending combinations, interfaces and transcendence. Most of these would receive global economy's patronage but only

until the pandemic phases out as a passing phenomenon. Software and hardware industries on their own responding to the COVID19 situation of virtual education would push research in technology and product design engineering for inventing new tools.

A few research domains both macro and micro, separately and in combination would predictably last as the potential source of Techno-capitalist knowledge industry. Combination of the macro and micro has already been there for knowing the macro through extrapolation as in the case of Geology and Cosmology. Under the patronage of the knowledge industry, Cosmology has been receiving a lot of patronage for quite some by fits and starts. Plasma high-energy physics, mainly shockwave hypersonic velocity research, has been another area of the macro – micro combines receiving the Techno-capitalist industry's patronage. Similarly, the macro is being explored in terms of non-classical mechanics and impact physics through new means of measurement. Such science-tech hybrid areas focusing on micro space of nanometer and time of milliseconds instead of the macro space and infinite time are receiving the industry's attention.

Most advanced researches in these fields are being carried out in the huge transnational research establishments of the corporates. As already pointed out earlier more specialized researches in aspects of self-replicating particles, grapheme engineering, designing of nanotech sensors, transmitters, brain-computer interface objects etc., are in progress there. Several related fields of Techno-capitalist interest like microbiology, genomics, biotechnology, nanotechnology, artificial intelligence, robotics, bioinformatics etc., are already there in some of our higher education institutions. Under the pandemic emergency environment of centralized and bureaucratized control many of the areas of the corporates' interest would be pushed into the higher education curricula, with a view to developing human resource in rare fields. Corporates would need science-tech graduates of innovative faculty in plenty for them to choose the best to work at low cost in their research establishments.

It would be increasingly recognized that the developing world of poor quality higher education is rich in students of innovativeness. Since picking and training them as such being costly, the developing countries would be more and more encouraged to uniformly redesign their higher education to serve the purpose. Such redesigning and homogenizing reforms have already been in progress everywhere including India.
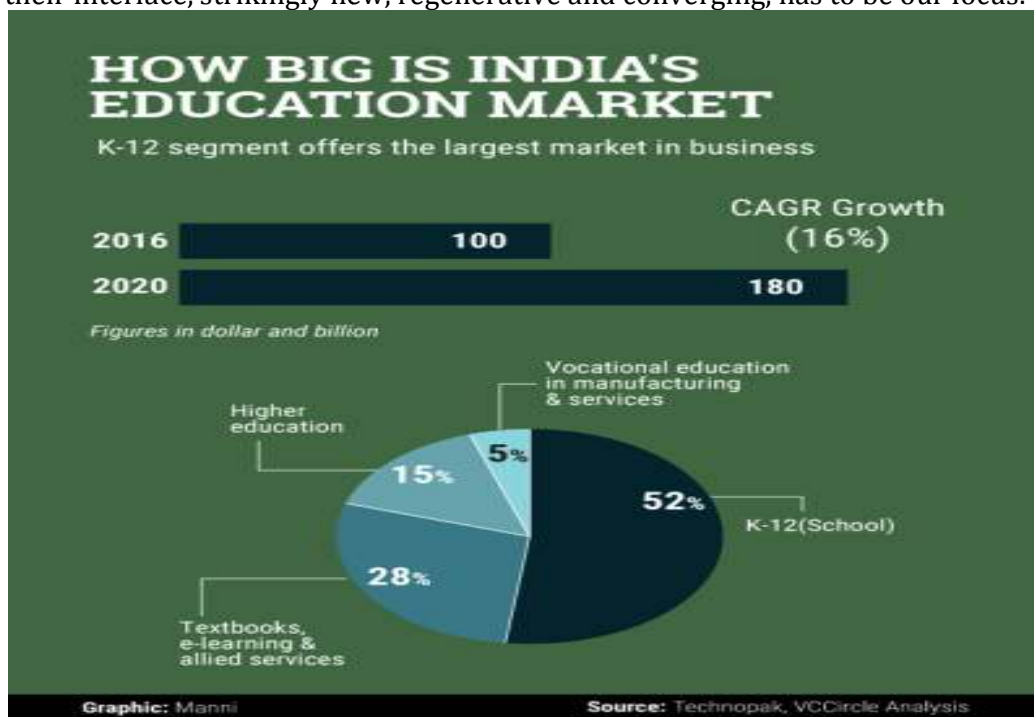
Disciplines will increasingly draw closer to one another in the wake of the emergence of more and more cross-disciplinary areas of knowledge. Blurring of disciplinary borders in higher education will demand cross-disciplinary literacy among teachers and adaptability among students. Growth of sciences through narrow specialisations in their turn becoming sub-disciplines of added rigidity will be forced to break the disciplinary silos and allow flexibility of choice in specialization across disciplines. Specialization giving precedence of parts over the whole impeding holistic understanding will phase out. This is because of the

corporate industrial interest in the opening up of knowledge fields of application in the interface of disciplines or their convergence.

Indian Context

What is striking about the Indian context is the rare demographic situation of having the world's highest population ratio of youngsters (World Youth Report, 2018). Out of the country's total population of about 1.32 billion over 65% are below the age of 35 and above 50% are in the age group of 18-23. About 140 million youngsters are in the age group of 17-20. As estimated by the International Labour Organization (ILO Report, 2020), India has today 116 million youth in the age group of 20-24, a strength that exceeds the Chinese youth population by 22 million. Today the average age of an Indian is 29 years, while it is 37 for China, 40 for USA, 47 for Europe and 48 for Japan. It is extremely important for the nation to judiciously design effective strategies for equipping the youth to be at their best with competencies of the 21st century in order to reap the benefits of this demographic dividend.

Let us hope that our premier institutions might succeed in equipping a microscopic minority among the brilliant youth for the technology of 21st century. We cannot be sure of their global competitiveness. Nevertheless, we may only export them for want of domestic market. It is therefore, essential for us to develop our own standard of higher education and research questions by coming to terms with the crucial problems that we encounter at the national, regional and local levels. Knowledge, generated beyond disciplines and across their interface, strikingly new, regenerative and converging, has to be our focus.

HOW BIG IS INDIA'S EDUCATION MARKET

K-12 segment offers the largest market in business

		CAGR Growth (16%)
2016	100	
2020	180	

Figures in dollar and billion

- Higher education: 15%
- Vocational education in manufacturing & services: 5%
- K-12 (School): 52%
- Textbooks, e-learning & allied services: 28%

Graphic: Manni   **Source:** Technopak, VCCircle Analysis

It cuts across wide ranging domains of knowledge from material sciences and manufacturing technology to natural sciences, ecology, biotechnology and healthcare. We should try and equip our brilliant youth for the production of new knowledge belonging to the interface of multiple domains of science and technology, which helps better understanding of the local and national problems.

Resolution oriented, local level issue based, interdisciplinary teaching and research, facilitating convergence of sciences and technology may be the viable alternative for us. Issues of local relevance can act as objects of convergence-research leading to new knowledge in science and technology, which will be inevitably innovative and far-reaching in its effects. Such a vision has its global standard too in terms of sustainable science and technology. On top of all it is based on ethical postulates relating to social and environmental justice.

What could be the post-COVID residual in the domain of higher education is an important question. In India, the higher education sector would largely remain the same but will be centralized under a single regulatory authority with the number of institutions highly reduced and made uniform through homogenization of curricula, academic programmes, and learning outcomes as construed by experts in the corporate knowledge industry. A centrally monitored single online podcast of course material will be nationally imposed. Institutions would be funded selectively through 'challenge mode' pressurising them to function as centrifuges sifting out best brains trained in high power computing to work in corporate institutions of science-tech hybrid areas.

Higher education institutions in the country will compete to provide teaching and learning environment appropriate for the production of enough graduates employable in knowledge industry. Both the central government and the UGC have already begun attempts to centralize academic decision making as evident in the proposal for homogenizing curricula, reduction of the number of public funded institutions, and cut in the fund made available to the existing institutions. Downsizing the entire sector including the reduction of teaching posts has been part of the educational policy of the MHRD ever since the GATS. KOVID19-induced dependence of education on the online mode provides a good pretext for implementing.

Indian higher education, not dependent on foreign students, will be least affected by the international supply chain disruption caused by the pandemic. Demographically favourable from the demand side, Indian higher education institutions would hardly face any scarcity of students and hence any revenue fall. At the same time the teaching/learning mode redefined due to dependency on virtual classrooms and online transactions, the cost will be less. However, the private institutions forging ahead investing for technological infrastructure and sophisticated educational tools might charge heavily.

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Part IV
Challenges and Recommendations

This is a contingent document of higher education policy advice in the COVID19 context, drafted by the following Committee constituted by the Kerala State Higher Education Council for submitting to the Government:

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This is the last part of the document. It has two sections: one dealing with challenges and the other, recommendations. As regards the first section, it is not an exhaustive survey of challenges in the sector of higher education. It is contingent upon the COVID19 crisis and contextual. There are many pre-COVID19 challenges not adequately encountered like strengthening the teaching/learning infrastructure. Recommendations are mainly in relations to the challenges and focus on means to overcome.

I. Challenges

We have to urgently remedy our characteristic problems by ensuring sufficient funding, good infrastructure, teaching faculty of adequate knowledge-base, updated academic programmes comprising courses of intellectually challenging content, clearly defined course outcomes and competencies, pre-planned instructional strategies, academic autonomy and flexibility capable of engendering criticality and creativity. Even if we succeed in ensuring all this, we will be nowhere near the global standards. Rush to equip our youth with competencies of global standards is unaffordable and unnecessary too. We have not been able to make teaching/learning realistic and least alienating. What we badly need is intimate and self-consciously realist learning, which means

systematic unlearning and recognition of new ignorance. Consciousness about the exponential growth of ignorance is what we have to achieve as integral to the teaching/learning system.

COVID19-induced new environment brings about directly and inadvertently a big shift in perspective regarding higher education. Mainly but ostensibly, it is the precedence of the ICT environment, which becomes predominant in the shift. First challenge is technological ascendancy and its massive addition of techno-infrastructural distributive injustice to the still unresolved economic and social inequalities or discriminations. It is going to be extremely difficult to sustain the perspective of equity and access. Further, it implies a series of imbalance, collectively referred to as digital divide. Above all it implies centralization, bureaucratization, and impairment of autonomy.

1. Online mode

Online mode is going to stay as a new normal and as the most important complementary to the present mode, if not *a de facto* substitute immediately. It is not COVID19 crisis that has introduced this technology. It has already been there, but more as optional and fashionable than essential. COVID19 crisis made it the only alternative. Webinars and Teleconferencing will become the regular practice. All this has been happening as a crisis-driven stopgap arrangement that precludes quality.

Computer, Internet, and ICT, are undeniably crucial to higher education. They have to be made integral to the university curricula, syllabuses and courses. Online mode has to be incorporated to the present system as a complementary part to reinforce the present classroom practices. Incorporation of online tools is not optional anymore.

At the outset it has to be accepted that Virtual Teaching is not a substitute for the Real that has all exclusive advantages of being real. Nonetheless, in the current circumstance of physical distancing Virtual Teaching/Learning is the sole alternative, which has already been complementing classroom teaching. Design, transmission and assessment of courses in online mode would gain precedence over the campus mode so long as physical distancing and immobility remain unavoidable. Even after the removal of pandemic restrictions, online mode would continue as synchronous and asynchronous complement. Blended teaching/learning shall be a new normal.

a) Online Infrastructure

Online teaching without necessary tools and professional competence will compromise quality. Online teaching without its sophisticated multi-media digital content is a tedious job for teachers and a burden done the students. It should be well-designed audio-video data transmission exploratory enough to teachers and an extremely rich learning experience inspiring enough to students.

Differences between online and classroom teaching are not just those confined to the medium and environment. They range across the art or science of teaching, designing of learning outcomes, techniques of communication, ways of facilitating learning, and methods of evaluation. Synchronous instructions and asynchronous learning replicating on-ground teaching/learning in online mode cannot meet these challenges.

Teachers have to use online instructional methods/tools such as software-driven course designing, web-based instruction, computer-mediated communication, mind mapping, administration of videos, imaging technology, infographic visualization, participatory learning facilitation, hosting the audio/video podcasts, and effective management of digital content. Visual tools help in a graphical or pictorial way to represent ideas and concepts amenable to comprehend, analyze, synthesize, evaluate and generate their new forms. Opposed to a linear text, mind mapping, infographic, and imaging tools help structure knowledge along the line of the cognitive process. Quality online teaching/learning and evaluation tools are high-input facilities demanding considerable investment for establishing the necessary technological infrastructure.

Growth of Higher Education Institutions
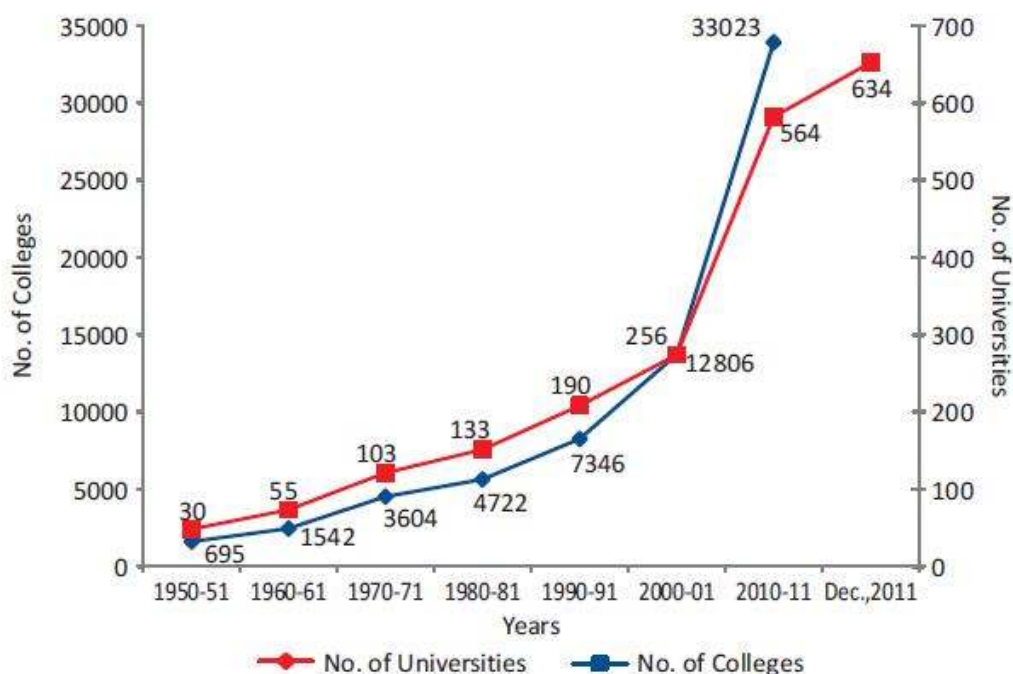
Source : MHRD / UGC

Uninterrupted access through satellite or fibre-optic circuits or mobile networks of sufficient bandwidth is considered essential in all. High speed and low cost Internet access must be available to all higher education institutions.

The availability of hardware, software, network equipment, connectivity, and 24X7 reliable information are keys to bridging the digital divide in education. It is necessary to provide a benchmark for institutional infrastructural requirements.

It is high time every university has completed campus area networking and implemented institutional administration based on the system of enterprise Resource Management (ERP) enabling perfect academic career accountability of teachers as well as students from their entry to exit.

b) Digital Divide

Many teachers are worried what they would do if students prefer virtual mode of learning to actual. Even then teachers as trained professionals in web-based teaching with advanced digital tools would be inevitable as good mentors helping students how to learn. Technological obsolescence of pedagogy will widen the generation gap between students and teachers.

Many socio-economic inequalities and cultural discriminations still persist in the state, which have their negative impacts on higher education. As regards higher education institutions, there is grave academic and extra-academic unevenness among colleges, universities, and their faculty. Unevenness exists in matters of basic learning facilities, curricular and co-curricular activities. Nevertheless, there are certain minimum facilities benchmarked. Similarly, there should be benchmarks for institutional level infrastructure for online education. Digital divide in the competitive context puts one section totally disadvantaged. Bridging the digital divide among teachers and students as well as between teachers and students helps improve academic performance.

It is extremely important to evolve ways and means of bridging the digital divide. Concrete data regarding the nature and causes of digital divide existing in Kerala have to be collected for adopting measures to bridge it. There must be safeguards to ensure that there is no dropout due to online turn. If online is to work effectively there must be flexibility in place, time, transaction and evaluation. Such flexibilities must be brought in as a part of the online system. Introducing flexible systems and practices suitable to online systems of education is hence a crucial factor. Basic requirements to permanently bridge the digital divide in education are availability of hardware, software, network equipment, connectivity throughout 24x7. In Kerala the local self-governing institutions, voluntary organizations, and industries can help in setting up renewable energy based digital technology centres for rural colleges as they did in the case of schools in the remote villages along the forest fringes.

c) Quality

We should redefine the parameters of equity, access and excellence to ensure that the online mode does not operate outside the ambit of these essential requirements.

Pandemic-driven shift to online mode would increasingly encourage mushrooming of various soft skill-based programmes and shallow hands-on trainings in all the universities.

It is important to take precautions to ensure quality. Unless employability is ensured through guaranteed skill/competency, the programmes would only add to the various self-financing programmes.

Although the UGC allows such certificate/diploma programmes, it is important that universities confine themselves to their institutional mandates – research, production of knowledge and its transmission..

Technological sophistication alone cannot ensure quality, for it helps higher education to be more centralized and bureaucratic. In order to achieve quality higher education we have to decentralize and de-bureaucratize the whole set up.

d) Online Technology Training

Teacher training programmes in the country have not been adequately updated in the country as yet, in spite reforms proposed regarding the duration. Although teachers in colleges and universities are periodically updated/upgraded in their knowledge fields, they lack pedagogic training.

Onset of online mode will put them more disadvantageous. We have to think about the ways and means of training teachers in the use of the latest technology and tools. It is necessary to turn all teachers into professionals capable of using the technology innovatively and train students how to make the best of it.

Many have switched to online teaching but under compulsion and mostly without previous experience. By and large online teaching today is the classroom lecture carried forward to the virtual. It should have been at least a smart classroom teaching rendered as podcast. Online teaching/learning as COVID19-induced mode under crisis management has been largely the conventional practices carried to the virtual mode. It is important for teachers to be formally accustomed to the art, science, and methods of ICT based pedagogy for being effective in Virtual Teaching.

A teacher should learn online instruction methods and models of communication to run online courses effectively. Finally, s/he should know the use of technology for formative and summative assessments of online courses. Converting a conventional course into online mode is not an easy task.

Teachers have to formally learn how to design online courses using the Instructional System Design (ISD) based on ADDIE, the generic five phases — Analysis, Design, Development, Implementation, and Evaluation.

National Programme on Technology Enhanced Learning (NPTEL), which is an initiative by seven Indian Institutes o f Technology (IIT Bombay, Delhi, Guwahati, Kanpur, Kharagpur, Madras and Roorkee) and Indian Institute of Science (IISc) will be helpful for creating course contents in engineering and science.

It is important to understand the features of online technology and acquire skills in using the open source platforms and Learning Management Systems (LMS) like SWAYAM and MOODLE. Many have started familiarizing themselves with platforms like Zoom, Google Talk, Google Hangouts, Google Classroom, Google Docs, Google Forms, G-meet, JIt, Cisco Webex etc., for running online courses and participating in online conferences. Training in all these is extremely important as an essential means of quality assurance in higher education. Teachers need participatory workshops and hands-on training in multimedia tools for enabling them to professionally rearticulate themselves without leaving their tasks to substitutes. They must be trained in Multimedia Production Tools as well. All this are going to be integral to teaching and learning even during the post-pandemic times.

For the promotion of group activities and human research development in experimental science and other branches of knowledge, Universities in the state should take help from Inter University Accelerator Centre, the first Inter-University Centre established by the UGC for developing within the university system world class facilities for accelerator based research, formulating common research programmes, and developing collaboration with universities and other premier research institutions.

UGC-Department of Atomic Energy (DAE), created for developing competence and promoting research in front line areas of science and technology in Indian Universities..

Inter University Centre for Astronomy and Astrophysics (IUCAA), Pune helps initiate research and developmental activities in Astronomy and Astrophysics in the University sector by providing advanced centralized facilities for subjects not adequately taught in the university departments and colleges. Our university departments interested in the field can use the facility.

Consortium for Educational Communication (CEC), an Inter University Centre of the UGC for addressing the needs of Higher Education through the use of powerful medium of Television along with the appropriate use of emerging Information Communication Technology (ICT). Of the 22 Educational Multi-media Research Centres (EMRC) established by CEC for the production of educational programmes, one is at Calicut University.

2. Strengthening Autonomy

Autonomy and flexibility are indispensable for higher education institutions to be enterprising and innovative.

Autonomy of universities has been steadily declining for the last two decades as a result of the post-GATS reforms of higher education. COVID19 emergency situation has accentuated the process.

Universities have to be wary of the impairment of their autonomy in the wake of the pandemic emergency that necessitates bureaucratic dictation of the terms and norms of academic working, alterations in the curricula, instituting new programmes, and design of courses.

A new set of accountability criteria would be necessary for higher education institutions to function smoothly and autonomously with Online Course Management Systems.

It is necessary to modify the university Acts, Statutes, and Ordinances with a view to strengthening the autonomy of Universities and enabling them to creatively respond to crises in future.

3. Centralization and Discrimination

Covid19 pandemic crisis demanding a total juridico-political centralization and bureaucratization has deprived higher education of its academic autonomy.

There would be high-level centralization of higher education in the country using Internet and ICT. A single online podcast hosting academic programmes, courses and course-material by way of texts and videos has already been proposed.

Centralization is a need of corporates, which they have been trying to nationally impose for homogenizing the curricula under the pretext of enhancing academic quality and industrial employability.

It is necessary to rethink the management of higher education in Kerala by drawing insights from the state's decentralized set up under democratic centralism, which could effectively combat the pandemic and excite global recognition.

Kerala's people's plan, local self-governing bodies, cooperatives and decentralized healthcare in collaboration with the district administration, line departments and the larger public have set a new model for crisis management. A decentralized but actively convergent, it is a model appropriate to counterbalance the rising trend of over-centralization in higher education.

In a developing country like India, where education is viewed as an item of expenditure rather than investment, ordinary universities would be asked to give importance to vocational programmes.

There would be a systematic reduction of allocation for teaching and research in liberal arts, humanities and social sciences. Programmes in them would be offered only in some of the old universities in the public sector and in a few very rich institutions.

Gradually universities offering liberal arts, humanities and social sciences would be subjected to academic and institutional discrimination.

4. Self-financing Institutions

Quality Assurance of Self-financing institutions in the higher education sector has been possible only in the case a few, while a large number of them remain unaccountable with respect to the academic qualification of teachers, their remuneration, students' fees, and their facilities of learning.

Barring a very few of them that are exceptionally good, the functioning of the rest has been abysmally poor and has deteriorated further under the pandemic lockdown.

It has already been nationally stipulated by the UGC that all higher education institutions must undergo assessment and accreditation ensuring academic accountability and credibility.

Assessment and accreditation is the only means that would promote their institutional self-regulation and guarantee social acceptance.

KSHEC has completed the prerequisites for launching state level assessment and accreditation of the self-financing and other higher education institutions in the state through its Centre (SAAC).

KSHEC has also initiated programmes like the All Kerala Survey of Higher Education Institutions and the Kerala Institutional Ranking Framework (KIRF).

These initiatives are based on several parameters and some of which like understanding the research output of individuals/institutions necessitate the use of bibliographic databases like Scopus or the Web of Science.

Ranking systems like National Institutional Ranking Framework (NIRF) and other Global Ranking Systems use Scopus database to populate and verify the data of parameters of research, patents, h-index etc.

Accordingly, the Government of Kerala has to strictly require the self-financing institutions to undergo assessment and accreditation for being eligible to start new academic programmes.

5. Added Relevance to the Commencement of Open University

Universities providing the facility of distance education to people who are unable to pursue regular courses have become more relevant in the wake of the pandemic lockdown. Under COVID19 pressure regular universities having forced turned to operate in distance education mode, Open University system has acquired an added legitimacy too.

There are Fifteen Open Universities in India offering various certificate/diploma, undergraduate, postgraduate and doctoral programmes under Open Distance Learning System (ODLS).

On an average about three lakh candidates used to enroll every year to continue their higher education through ODLS provided by three regular universities in Kerala and Open Universities elsewhere, especially Indira Gandhi National Open University (IGNOU), until its disruption by the UGC's insistence of NAAC Grade above 3.25 as mandatory (UGC Regulations 2018).

Some interim arrangements have taken care of the students already enrolled. A very large number of candidates are deprived of ODLS strongly desire an Open University in the state at the earliest. Kerala has been in an all set stage of preparedness for the past two years to launch its Open University. Having realized the urgent need and the avoidance of further delay, the Government has issued orders for its immediate establishment. It is expected that the Open University will come true at the earliest.

6. Strengthening the Institutional Social Base

COVID19 situation demands Universities and Colleges to strengthen their social base and community support.

Higher education institutions have a social responsibility to help the larger public to be aware of how advanced knowledge impacts the quality of life and conditions of human existence. People have to be made aware of the problems and prospects of new discoveries and inventions.

COVID19-induced restrictions like physical distancing, lack of freedom to travel and the precedence of the open online mode would force campus spaces to undergo changes. Lecture halls and classrooms would turn into integrated teaching spaces and hands-on learning workshop spaces accommodating not only regular students but also others in the larger society.

There would be a conversion of rigidly defined specific spaces in the higher education institutions into flexible open spaces amenable to multiple uses including those of the community learning and research.

7. Entrenching Cross-disciplinary Perspective

Entrenching cross-disciplinary perspective is easier said than done, for disciplines would not allow it. Nevertheless, as knowledge grows, disciplines are drawing closer to one another, blurring their traditional contours and boundaries. There is convergence of disciplines explicit in all the emerging knowledge fields. Teachers with cross-disciplinary literacy alone would be able to handle them. Students would need the help of such teachers for them to acquire high order cross-disciplinary adaptability, an indispensable prerequisite for higher studies.

It is extremely difficult to pull teachers out of their rampant and impervious disciplinary silos. Most of them are not amenable to initiatives of cross-disciplinary literacy.

Like technology, it is too difficult for the majority to resist the rise of cross-disciplinary knowledge fields that the dominant economy engenders. Interestingly, it is not disciplines, but some of the cross-disciplinary fields that can confront the dominant economy's agenda. Critical political economy, anthropology of development, environmental science, women studies, Dalit studies etc., are examples. Dominant economy would not allow such cross-disciplinary fields to thrive for obvious reasons.

Corporate economy subsidizes production and transmission of cross-disciplinary knowledge in science-tech hybrid fields, which is globally marketable. Under its pressure most universities would be encouraged to turn themselves into multi-disciplinary institutions of high standards with cross-disciplinary teaching and research.

Universities and autonomous colleges would be required to develop innovative courses and curriculum in such fields, follow centrally approved learning outcomes, and conduct continuous evaluation.

8. Emerging New Areas of Knowledge

It is not possible for us to percolate all the emerging new areas of global science and technology into our university and college education. It is not necessary either, for it is counterproductive to dump pre-packaged science and technology of global value into all heads. Knowledge is not a linear growth in technology/science, but dynamic, uncertain and in flux always.

There are several liberal arts, humanities and social sciences of great relevance not appropriately promoted in the higher education institutions of Kerala. While all of them are taught independently, their mutually complementary combinations have not been tried much. Any of them in viable combinations is a potential area of knowledge in the present day context. Anthropology is the most suitable elemental discipline that turns any of the liberal arts, humanities and social sciences into alloy like combines of strength.

Anthropology, a leading knowledge field among social sciences the world over including India, though had renowned advocates in Kerala, is least represented in the state's higher education today. It is being taught independently and in combination with all other branches of knowledge including science and technology in most universities the world over.

Universities and colleges should think of combining anthropology with languages, linguistics, arts, archaeology, history, economics, political science, sociology, psychology, ethics, gender studies, food science, public health, community studies, local self-government, cooperatives etc., at the undergraduate and postgraduate levels. Schooling of ethnic groups in their own language has been a question in Kerala too against the loss of indigenous cultures. Anthropology of orality and literacy has been a scholarly area of wide world attention, but for Kerala. As a cross-disciplinary field, it deserves attention of the state's higher education institutions.

Economic anthropology dealing with livelihood systems, development, urbanization, globalization etc., has developed into newer sub disciplines of anthropology, like business anthropology today. It is very important as a sub-discipline in relation to the various fields of medicine, environment science and disaster management studies.

Anthropology of Disasters has developed in India since the Tsunami. Disaster prevention and preparedness, vulnerable populations, cultural factors inhibiting preparedness and prevention, equitable resilience and other factors, are becoming increasingly relevant to Kerala.

9. Revamping the Examination System

A major challenge that the online mode poses is the need for a total revamping of the existing Examination System that is heavily dependent on descriptive accounts. Mere shift to Optical Mark Recognition/Reading (OMR) evaluation system, heavily dependent on multiple-choice questions, will not help. Technological adoption must be sophisticated enough to be in perfect alignment with Outcome Based Education (OBE).

Assessment methods have to be based on Bloom's action verbs or stem words adequate for ascertaining the knowledge categories (KCs) and cognitive levels (CLs). Teachers have to frame questions with action verbs targeted to capture understanding of each KCs and CLs separately or in combinations. Different values have to be assigned to KCs and CLs in order to evaluate the demonstration in the answers as the proof of attainment of the level. They have to set the Criteria for identifying the perfection in attainment at each level and evolve Criteria Relied Assessment Method (CRAM) for the graded evaluation of students.

Institutions and Governments have to bring about necessary changes in the organisational structure for facilitating the OBE based evaluation as new normal in the higher education institutions. Many technologically updated proctored

centres will have to be established by universities themselves for the conduct of examinations assured of reliability and quality.

10. Earn While You Learn

Earn While You Learn (EWYL) is a socially significant scheme that deserves promotion with caution. Kerala has great potential for the implementation of the scheme provided there is proper planning, funding and co-ordination by government and universities. For a state like Kerala it adds to social security, equity, and access guaranteed to a certain extent by merit cum means scholarships.

There are many benefits for EWYL Scheme. Most important is mitigation of economically backward students' hardships in education due to income shortage, inculcation of dignity of labour including values of hard work among students, enhancement of skills adding to employability, strengthening of resourcefulness to take up better jobs in the future, development of personal interest and preference in the fields of learning, reduction of the sense of alienation in the students' minds about what they learn, and transformation of higher education into a self-directed, personal, and life-related enterprise, not always curiosity driven though.

EWYL Scheme will be effective and sustainable as a transforming initiative only if the Universities and Colleges provide for flexibility and choice in their governance, which should attract and retain students by providing them adequate environment to acquire professional skills to take up temporary jobs to earn while they learn.

We have to be cautious because in the developed countries this scheme is meant to encourage the Government to withdraw from the financial assistance to the poor students. It is a scheme that gives the employers a good opportunity to influence curriculum design and course content, so as to reduce their recruitment and training costs.

II. Recommendations

Recommendations given below are mainly contingent and selective under the COVID19 crisis pressure. Although some of the general points are also included, they are not exhaustive. We have to go on evolving the implementable ways and means of overcoming challenges.

Measures to make the shift to online mode smooth and quality ensured:

Integrate Computer, Internet, and ICT to the university curricula, syllabuses and courses. Incorporate them as inevitable tools of higher education.

Virtual Teaching/Learning, the sole alternative under the compelling circumstance during the pandemic, has to be rendered possible with all necessary infrastructure and technology.

KSHEC seeks to advise universities in the state to assess not only their obsolescence in the curricular content and pedagogy but also in the technological infrastructure.

Traditional parameters should undergo changes when the online mode gets integrated into the formal system. Therefore, KSHEC would undertake a study regarding the changes in such parameters to ensure that Kerala retains its merits even while using online education as a complementary system.

All higher education institutions should have online blended teaching/learning facilities of synchronous and asynchronous types as a new normal.

Every university and college should have more smart classrooms with computerized writing/display boards.

All advantages of technology in the art or science of teaching, designing of learning outcomes, techniques of communication, ways of facilitating learning, and methods of evaluation must be utilized to narrow down the differences between the actual and virtual.

Teachers should be following Learning Management Systems (LMS) developed in open source platforms like SWAYAM and MOODLE. They should use MHRD's Virtual Laboratory.

Ideally, it is better for every institution to have a platform and LMS of its own for designing and teaching online courses.

Teachers must be enabled to use online instructional methods/tools such as software-driven course designing, web-based instruction, computer-mediated communication, mind mapping, imaging technology, infographic visualization, participatory learning facilitation, hosting the audio/video podcasts, and effective management of digital content.

Adopt measures to ensure the availability of quality online teaching/learning and evaluation tools that are high-input facilities in as many institutions as possible. Ensure there is sufficient allocation for providing the necessary technological infrastructure.

Uninterrupted high-speed low cost Internet access through satellite or fibre-optic circuits or mobile networks of sufficient bandwidth must be available to all main colleges and universities in the state.

Outcome Based Education has to be properly understood to rearticulate the Curricula, syllabuses, Course Outcomes, Programme Specific Outcomes and Graduate Attributes before integrating the online as complementary to the classroom teaching learning environment.

Measures to bridge the Digital Divide and strengthen the cause of equity, access

The first step towards bridging the digital divide is a detailed stocktaking of the situation. KSHEC should generate concrete data regarding the nature and extent of digital divide existing in the state for evolving strategies to bridge it.

KSHEC has to conduct a survey to assess the social preparedness to satisfy the prerequisites for online teaching and learning.

It is specifically to assess the technological accessibility of the students and identify the ways, means, and source of support for equipping the students lacking it.

Support of Local Self-Governing Bodies, State Library Council, Kudumbashree, cooperatives, voluntary agencies, charitable societies and individuals could be sought for assessing the number of students unable to access the facilities as well as for resolving their problems.

Immediate attempts must be made to ascertain whether there are dropouts in higher education due to the lack of essential facilities for online learning. Institutions must be told to ensure that there is no dropout wanting facilities to access online teaching.

There must be immediate steps to provide laptops/tablets or smart phones to poor students. Institutions have to provide free Internet and free equipment/tools for the poor.

Government should institute more scholarships for poor students to buy the necessary equipments to avail themselves of the online learning facility.

Special attention is required to resolve the shortage of infrastructural facilities among colleges and universities in the backward areas.

It is necessary to determine the benchmarks of technological infrastructure for online education and make sure that all the public funded colleges, where the poor students congregate, satisfy them.

It is necessary to introduce flexible systems and practices, which are suitable to online systems of education. Flexibility in place and time of teaching and evaluation has to be ensured.

Colleges and universities should make sure that online teaching and evaluation involves no competitive context putting poor students disadvantaged.

There should be special care about bridging the digital divide among teachers. KHEC has to advise the government to provide enough funds for upgrading technological infrastructure.

Institutions should mobilize support from Local self-governing institutions, cooperatives and other voluntary agencies/individuals for equipping poor students hailing from remote areas of no connectivity for online learning.

In Kerala the local self-governing institutions can help in setting up renewable energy based digital technology centres for rural colleges of Kerala as the state did for the schools in the remote villages along the forest fringes.

We should redefine the parameters of equity, access and excellence to ensure that the online mode operates strictly within the ambit of inclusiveness as well.

It is necessary to see that teaching/learning practices, their environment and administration ensure flexibility and choice.

Universities have to strictly follow the quality assurance criteria in the case of pandemic-driven shift to online mode that would increasingly encourage mushrooming of various soft skill-based programmes and shallow hands-on trainings in all the universities.

It is extremely important to see that such programmes satisfy the avowed skill/competency enhancing employability.

Although UGC allows certificate/diploma programmes, it is always better for universities, as institutions mandated for production and transmission of new knowledge, to concentrate on postgraduate programmes and research.

It is inevitable to decentralize and de-bureaucratize universities in order to enhance quality.

Strengthening Inter-University Networking

KSHEC should try and strengthen inter-university resource sharing networks among universities and colleges.

KSHEC has to persuade the Vice Chancellors to materialize KALNET, the inter-university library network initiated by the Council, by asking their Librarians to upload the data to the Council's Cloud.

Vice Chancellors have to see that their University Libraries are networked and their automation completed with Online Public Access Catalogues (OPAC).

They should ask their librarians to link the University level networks to form the KALNET.

KSHEC has more or less completed the prerequisites for launching state level assessment and accreditation of the self-financing and other higher education institutions in the state through its Centre (SAAC).

KSHEC has to go ahead with its initiative of the All Kerala Survey of Higher Education Institutions and the Kerala Institutional Ranking Framework (KIRF).

It would be useful to establish Inter-University Community Radio for knowledge transmission.

Institutions should prepare and circulate a multi-media package for social awareness about the implications of research in advanced knowledge fields. They should hold popular campaigns throughout the state with the help of local self-governing institutions.

Centralized Inter-University Consortium has to be established by KSHEC for enabling higher education institutions in the state to access Journals and Research publications at an affordable cost.

Training Programmes in Online Technology

It is essential to train teachers in the use of the latest technology and tools for making them professionals in online teaching.

It is necessary to organize training programmes suitable for mobilizing the resources of teachers by providing them a wide range of holistic solutions to the challenge of online teaching, which can make them professionals in the higher education sector.

The training should make the teachers formally accustomed to the art, science, and methods of ICT based pedagogy to be competent in Virtual Teaching.

Teachers should be trained how to convert a conventional course into online mode and how to design online courses afresh using the Instructional System Design (ISD) based on ADDIE.

It is important to enable teachers to use the open source platforms like SWAYAM and MOODLE, besides the tools like Zoom, Google Talk, Google Hangouts, Google Classroom, Google Docs, Google Forms, Cisco Webex etc., for running online courses.

Teachers in science and technology should be familiarized trained in the initiatives of NPTEL and IISc for drawing insights in creating course contents in engineering and science.

It would be necessary to train teachers in imaging tools and the use of multimedia for interactive online teaching and associated content delivery.

Online training should include the socio-economic and politico-cultural aspects the technology of online education as a prominent module of the teacher training curricula.

Centralization, Decentralization and Autonomy

It is important to resist centralization and bureaucratization in higher education under the emergency of COVID19 pandemic crisis.

A new set of accountability criteria should be evolved for higher education institutions to function smoothly and autonomously.

There should be measures to protect the autonomy of the Universities, which could impair in the wake of the introduction of online technology.

It is necessary to modify the university Acts, Statutes, and Ordinances with a view to strengthening the autonomy of Universities and enabling them to creatively respond to crises in future.

Universities should draw insights from the Kerala's decentralized set up under democratic centralism to effectively reorganize themselves to combat the centralization moves.

Universities should develop a decentralized but actively convergent model appropriate to retain their autonomy.

Universities should be able to resist central imposition of homogenization of academic programmes and introduction of new generation science-tech programmes at the expense of teaching and research in liberal arts, humanities and social sciences.

Universities should be able to resist withdrawal of financial support to liberal arts, humanities and social sciences to support new generation programmes.

Universities should resist discrimination against institutions offering liberal arts, humanities and social sciences.

Instead of following the Manual of Office Procedure and Secretariat Manual, a Manual of Academic Administration has to be evolved to place academic concerns above bureaucratic procedures.

Assessment and Accreditation of Self-financing and other Institutions

Assessment and accreditation of self-financing institutions in the sector of higher education should not be delayed anymore.

Accordingly, the Government of Kerala has to strictly require the self-financing institutions to undergo assessment and accreditation for being eligible to start new academic programmes.

SAAC has to be made more active under the institutional quality assurance programme for assessing the self-financing institutions in the higher education sector.

Assessment and accreditation of self-financing institutions must be scheduled immediately for the promotion of' their accountability, self-regulation and social acceptance, as stipulated by the UGC.

Need for Strengthening Community Base

Universities and Colleges should develop community higher education seeking to democratise social benefits of higher knowledge by adopting various ways and means of communication including multi-media.

This is to help the larger public to be aware of how advanced knowledge impacts the quality of life and conditions of human existence. People should be made aware of the problems and prospects of new discoveries and inventions.

Universities and Colleges have to embrace the local community and supra-local industries for support to reposition themselves as social extension centres of participatory research and life related student services both online and in-person.

Universities should come up with a protocol for disaster management ensuring both the continuation of activities and emergency policy adoption/decision making during crises like lockdowns.

If such a protocol were in place at the University level, it would have been possible for the university to extend academic interventions in local social issues and matters of public concern too.

Every university should strengthen contacts with the local self-governing institutions, cooperatives and health centres by inviting them along with the general public on the Open Day for interacting with the researchers, understand their research, and see their labs, workshops and museums.

Higher education institutions have to open up spaces of social collaboration for the production of socially essential science and sustainable technology relevant to their region.

Teachers and researchers must engage the space using the faculty to recognize the socially beneficial aspects of their fields and democratize them through people's participation.

Similarly, these proactive academics must be radical enough to democratize the negative aspects of the various fields of knowledge too.

A region like Kerala with its decentralized and de-bureaucratized self-governing institutions has enormous potential to make higher education institutions self-reliant in the field of production, consumption and exchange of socially useful new knowledge.

Without patent motives and IPR possessiveness, higher education institutions must direct part of their research towards the production of local problem solving knowledge.

If institutions fail to act accordingly the exploitative dimension of the knowledge industry will go totally unbridled, generating and widening consumer needs for detrimental goods and services.

Teachers' cross-disciplinary literacy and students' interdisciplinary adaptability:

Teachers have to acquire cross-disciplinary literacy to be able to handle the emerging fields of knowledge, which are invariably interdisciplinary.

More workshops should be organized for nurturing cross-disciplinary perspective in teachers for helping students to acquire high order cross-disciplinary adaptability, an indispensable prerequisite for their higher studies.

It is important to promote the cross-disciplinary fields like critical political economy, anthropology of development, environmental science, women studies, Dalit studies etc., which can confront the dominant economy's agenda.

New Academic Programmes in Emerging Fields – Guidelines

At the outset it may be noted that there is no point in duplicating discipline based traditional programmes anymore.

All new academic programmes in emerging areas of knowledge may be designed invariably in interdisciplinary/cross-disciplinary perspective and with clearly conceived measurable learning outcomes.

Nevertheless, programmes in basic sciences including social sciences and humanities are important, but all new undergraduate programmes in them must be multidisciplinary.

It is not advisable to institute undergraduate programmes in any of the specialized branches of basic sciences or interdisciplinary science-tech fields.

Undergraduate programmes in sub-disciplines like biochemistry, biotechnology, microbiology and the like should not be encouraged anymore, because they require strong knowledge base in the basic science of each first.

All undergraduate eight semester Honours Programmes must be combinations of two/three major disciplines, under the scheme of double majors or triple majors.

Conventional undergraduate programmes in Physics, Chemistry, and Biological Science may be turned into Integrated Sciences Programme with Mathematics

and fundamentals of Earth and Environmental Sciences for BS/BSc Honours as combinations.

It is not advisable for universities to institute Diploma/Certificate programmes in any forms or schemes of examination at the undergraduate/postgraduate level, although the UGC approves of them. We insist adherence to production and transmission of new knowledge, the globally mandated principal objective of the university.

Postgraduate Diploma Programmes under the label, vocational or with the claim of employability could only worsen academic quality and add to the unemployable.

University level academic programmes in emerging fields of super-specialization must be research oriented and hence they must be offered as Ph.D programmes rather than postgraduate diploma programmes.

University – Industry Tie-up Academic Programmes in science-tech fields with mandated hands-on/internship should be invariably as four semester Master's programmes or Ph.D programmes.

It is advisable to keep in mind International Standard Classification of Education (ISCE) and International Standard Classification of Occupations (ISCO) before choosing emerging fields of studies.

Some such emerging areas of studies for Ph.D/Post-Doc Programmes are Structural Genomics, Functional Genomics, Automated Methods and Microarray Technology, X-Ray Crystallography, High Field NMR Spectroscopy, Bio-pharmacology, Bio-informatics, Agro-biotechnology, DNA Bar-coding of Species, Industrial Biotechnology, Environmental Biotechnology, Medical Biotechnology, Synthetic Bioengineering, Medical Engineering, Imaging Technology, Molecular Engineering, Nano-technology, Graphene Engineering, Robotics, Artificial Intelligence, and Astrophysics.

We can think of advanced science and technology domain consists of various combinations like Natural Science and Environment, Materials Science and Chemistry, Industrial Fundamentals, Development Economics and Equity, Informatics and Energy, Renewable Energy and Conservation, Impact Physics and Non-classical Mechanics.

Universities should be able to pursue high-quality research across sciences and engineering. Development and Alternative Technology, Alternative Development and Appropriate Technology, Development and Equity, Social Infrastructure and Environment, Environmental Social Auditing and Sustainable Development, Development-induced Climate Change and Climate Justice, Climate Change-induced Disasters and Disaster Management, Environmental Engineering and Resilience, Sustainable Engineering and Resilient Rebuilding, It should be in symbiotic sciences, advanced natural science and applied technology contributing to environmental conservation as well as sustainable development.

Universities may encourage conduct of forefront researches meeting the various demands of society by deepening comprehensive knowledge in natural sciences and technologies. There is plenty of scope for such combinations across various sciences, technologies, social sciences, liberal arts and humanities as constituents.

Universities can do a lot in this line by opening up new science-tech fields as well as applied studies capable of contributing to sustainable development. Anthropology is the best element that can give the strength of an alloy in cross-disciplinary combinations.

Anthropology can combine itself with any of the liberal arts, humanities and social sciences. Anthropology of language and linguistics, social movements, leadership, decentralization, local-self-governing institutions, cooperatives, community medicine, public health, nursing, psychology, social work, aging population, crisis of youth, development, business management, industry, disaster management, vulnerable populations, gender discrimination issues, women empowerment are examples. Some of these are very relevant today as action anthropology.

Economics can be combined with any of the other social sciences. Local resource assessment and cartography, local economic geography and social composition analysis, rapid urbanization issues and heritage conservation methods, material culture studies and archaeological preservation etc., are other combinations in social sciences.

All Academic Programmes in emerging areas must be distinct for the well-conceived Programme Outcomes abstracted out of Course Outcomes as stipulated under Outcome Based Education (OBE) and with knowledge categories (KC) and cognitive levels (CL) tagged to each module of the syllabus content (SC).

Adding to the Social Security of Students

It is important that all the higher education institutions provide for the successful implementation of Earn While You Learn (EWYL) scheme that is a very important and socially significant initiative.

Universities and Colleges facilitate inculcation of dignity of labour including values of hard work among students, enhancement of skills adding to employability, and strengthening of resourcefulness to take up better jobs in the future through EWYL exposure.

Universities and Colleges should provide for flexibility and choice in their governance, to attract students to the Scheme.

Institutions should create an adequate environment through hands-on courses for students to acquire professional skills enabling them to take up temporary jobs to earn while they learn.

Institutions have to be cautious against the lurking danger of exploitation of student labour and penetration of industrial interests into the curricula at the expense of academic quality.

Government has to provide enough financial assistance to the poor students to make the best use of the Scheme.

Revamping the Examination System

Universities should undertake the task of a total revamping of the existing Examination System that is heavily dependent on descriptive accounts and the ability of students to remember. They should take care of assessing higher levels of cognition, analytical faculty, language power and creativity too.

Mere shift to OMR evaluation system, dependent on multiple-choice questions alone, will not be of any use.

It is essential to adopt technology/tools sophisticated enough to be in perfect alignment with OBE.

Assessment methods have to be based on Bloom's action verbs or stem words adequate for ascertaining the knowledge categories (KCs) and cognitive levels (CLs).

Teachers have to frame questions with action verbs targeted to capture understanding of each KCs and CLs separately or in combinations.

Different values have to be assigned to KCs and CLs in order to evaluate the demonstration in the answers as the proof of attainment of the level.

Examiners have to set the criteria for identifying the perfection in attainment at each level and evolve Criteria Relied Assessment Method (CRAM) for the graded evaluation of students.

Institutions and Governments have to bring about necessary changes in the organisational structure for facilitating the OBE based evaluation as new normal in the higher education institutions.

Questions are powerful guides that direct students to think in certain ways. Every question creates an internal frame of reference or perspective triggered by the words used to ask it.

Questions should demand the intended learning outcome. It could be to recollect facts or to illustrate a concept or to demonstrate understanding or to apply a theory or evaluate a theory or to criticize it or to modify or reject or substitute it.

Questions should demand the students to perform by way of remembering facts, understanding concepts, and applying procedures; making self-reflection, identifying a system/structure, analyzing it into its constituents, restructuring the constituents into other possible structures, evaluating the system/structure, and creating a new system/structure.

Questions should test the attainment of all outcomes intended of the course and the programme.

Questions should be given weightage on the basis of the level of cognition intended. The highest weightage is given to the cognitively most challenging question.

Fix the Structure/Pattern of the Question Paper scientifically. Scientific Method of doing it is by dividing the Questions into Six Groups in alignment with the levels of Cognition: Remember (R), Understand (U), Apply (Ap), Analyze (An), Evaluate (E), Create (C) or into three Groups by combining Cognitive levels: R+U, Ap+An, and E+C)

Distribute the weightage in terms of Marks/Points among the Six/Three Groups A,B,C,D,E&F Or A,B &C (Scientific Method of doing it is to give lesser weightage of marks/points to the Groups in the ascending order Eg: 5%+10%+15%+ 20%+25%+25% Or 10%+30%+60%) in the case of Undergraduate Examination.

Distribute the weightage in terms of Marks/Points with added importance to the higher levels of cognition: Apply, Analyze, Evaluate and Create; in the case of Postgraduate Examination. (Scientific Method of doing it is by dividing the Questions into Four or Two Groups with 10%+20%+30%+50% Or 40%+60%)

Preset the Model Structure/Pattern with Questions framed on the basis of the suitable out of the typology. There are software packages based on taxonomy available today.

Actually it is high time we have given up the system of centralized examination. If it is not possible immediately, Universities have to establish technologically updated proctored centres for the conduct of examinations assured of reliability and quality.

These centres should use Internet based electronically sophisticated devices like e-ink writers that can cover different ways of testing students' comprehension and cognitive levels.

It is advisable to use e-ink tablets amenable to online delivery of questions, reception of answers, and instant evaluation. This would enable introduction of Any Time Examination (ATE).

This would require only a few examination booths open over a fixed period of flexibility. Students could register their preferred slots, do the examination and get the result on the spot.

Various foolproof procedures ensuring confidentiality can be evolved by the university as required by the pedagogic requirements of knowledge fields and potentialities of the technology.

Technology will continue to grow whether or not the COVID19 phases out. Whoever uses it effectively will have precedence over others and the fate of the latter will be what Elizabeth Koobler-Ross described: People deny first, become scared, start bargaining, get depressed and finally accept. By the time they might have been considerably lagged behind.

Plan of Action

Survey of IT Infrastructural Facilities in HEIs in Kerala.

KSHEC has initiated steps to conduct a survey of IT infrastructural facilities in the higher education institutions in the state through its All Kerala Higher Education Survey Unit. This is a portal based survey to assess the ground realty about the availability of hardware, software, network equipment, and connectivity. It can provide significant inputs to government in the context of the proposed K- Fon project of the government of Kerala. The information gathered will be helpful for recommending policy measures to bridge the digital divide in education and prescribe a benchmark for infrastructural requirements in higher education institutions.

I. Short Run
   1. Coverage of Syllabus

An Academic Action Plan for the current year for the University Departments and the affiliated colleges should be formulated by each university to cover the entire syllabus of those programmes which were disrupted due to the lockdown. Employing on line/offline and the blended modes, the unfinished parts of the syllabus have to be covered within a stipulated time frame. The university departments in the state are well equipped to handle this situation as they have the infrastructure facilities in hand. There is need for scaling up the facility of affiliated colleges with large number of students and infrastructural inadequacy, for which assistance should be made available by the state/other funding agencies

   2. Conduct of Theory Examinations

The scheduling of the unfinished semester-examinations should correspond to the completion of the syllabi and the teaching/learning process. As usual the conduct of the examination should be under the strict monitoring of the university.

3. Conduct of Practical Examinations

External practical examinations can be given up. Instead, the mark/grade can be reckoned based on the performance during internal practical sessions. It is assessed and recorded by the teacher concerned as part of continuous assessment. The final mark/grade of the practical can be arrived at based on the average out of the marks/grades secured for each session. Where no internal practical sessions have been held, the practical examination has to be conducted observing the norms of social distancing.

4. Bar Coded Answer Books Inevitable

With the introduction of CBCSS at the UG and CSS at PG levels, majority of our Universities are using the Bar Coded Answer Books. This has not only ensured better security and confidentiality in the conduct of the examination, but also minimized the chances of malpractices in the examination hall. All universities should switch over to the system of Bar Coded Answer Books.

5. On-line Supply of Questions

All the Universities in the state should create in-house digital mechanism for online transmission of Questions to the affiliated colleges. The mechanism developed by some of the Universities in the state can be easily replicated. This change should be incremental and through modernization of the in-house facilities instead of outsourcing.

6. Return to Home Valuation

The conduct of Centralized Valuation Camps is not feasible in the present situation. Hence Home Valuation, the traditional practice has to be restored and carried out under the strict monitoring of the university ensuring no delay on the part of examiners.

II. Long-Run

Post-COVID educational scenario would be radically different from pre-COVID scenario. Still our basic objective would remain the same, namely democratization of higher education ensuring equity, access and quality. Traditional classroom technology is not irrelevant and is not going to be substituted by online learning on a massive scale. It is next to impossible for online platforms/universities to substitute physical and man power infrastructure available with traditional universities/colleges. However, online learning can provide the learners exposure to the virtual as a supplementary to the classroom learning. Traditional institutions can put in place essential online infrastructure with reasonable expense and expertise, to make virtual learning supplementary to face to face learning in such institutions. A blend of traditional and online learning strategy would be more effective than either traditional or online mode exclusively for ensuring greater access, equity and quality. Hence KSHEC has to conduct a detailed study to assess the digital infrastructure

facilities available in higher education institutions in the state. Based on the study a DPR may be prepared and submitted to MHRD/UGC/State Government for policy approval/funds/other facilities.

III. Teacher Training

KSHEC should conduct massive online training programmes for all teachers in the preparation and delivery of e—teaching materials within a specified time.

IV. Blended Curriculum

Universities have to be urged to revamp the curriculum of all programmes by incorporating e-content and e teaching –learning-evaluation strategies along with direct teaching and evaluation. All universities have to undertake this task within a specified timeframe.

V. Educational Multimedia Research Centre (EMRC):

Of the 22 Educational Multi-media Research Centres (EMRC) established by Consortium for Educational Communication (CEC), an Inter University Centre of the UGC, one is at Calicut University. CEC is for addressing the needs of Higher Education through the use of powerful medium of Television along with the appropriate use of emerging Information Communication Technology (ICT). Universities in the state can depend upon the EMRC at Calicut University for the production of MOOCs, e-content and production of ETV contents.

VI. A State Level Repository

A State Level Repository of online learning resources should be created for the benefit of all universities/teachers/ students with KSHEC acting as the central digital platform for all the state level requirements

VII. A State Level Consortium

A State Level Consortium for e journal with the participation of all the universities in the state has been initiated by KSHEC. This has to be speeded up and made operational at the earliest.

VIII. A Scheme of Special Funding

The flow of internal resources of the universities has been badly affected by the lockdown, necessitating special funding for Universities. Hence a new scheme may be worked out to decide on the quantum of funds to be devolved to the Universities based on their academic requirements.

IX. Free/Subsidized Online Infrastructure

There is need for increasing the access to online education and provision for Telephone/Internet/ Television/Laptops free of cost or at subsidized price to

the students Efforts taken by the Inter University Centre for Disability studies (MG University) and helpline facility at the university level for addressing the student grievances are good examples in this regard.

X. Enhancing Girls' Facilities
Girl students face shortage of various basic facilities like hostel. Health care, online access etc., in higher education institutions. KSHEC should assess the situation requiring special attention and make recommendations.

XI. New Academic Focus
COVID19 Pandemic has made a new turn in fields of learning. Various emerging fields of teaching and research have gained a new focus. Multi-disciplinary topics relating to pandemics, health care, and Environment have become relevant to teaching and research in universities and colleges in the state.

i) Integrated Post-graduate cum research programmes in a variety of industry friendly combinations of science, technology and Management may be designed and instituted by Kannur University, Calicut University, KUHAS, CUSAT, MGU, Kerala University and KTU. Kannur University can institute various cross-disciplinary programmes with Anthropology as the main constituent.

ii) Kannur University may develop cross-disciplinary programmes in Biochemistry and Biotechnology jointly with Calicut University and KUHAS.

iii) Calicut University may develop cross-disciplinary programmes at its Falcon Research Centre and the Centre for West Asian Studies.

iv) CUSAT and MGU can run industry friendly cross-disciplinary programmes in IPR, International Relations, and Nano-technology.

v) MGU can seek the ways and means of making KN Raj Studies Centre as a regular Centre for Cross-disciplinary teaching and research in Centre and Economic Relations. Among science-tech fields, it can request the Government the sanction of faculty positions for its International Inter-University Nano Scence-tech Research Centre.

XII. Gender Audit of Terms

KSHEC should conduct a gender audit of textbooks in engineering, medicine, psychiatry and law by holding a conference of experts in the field with a view to preparing a check-list of terms that require legal up-dating. A comprehensive guideline thereof has to be drawn for submission to the Government for policy adoption in the matter.

XIII. Total Revamping of the Examination System

KSHEC should take initiatives in revamping the examination system in the universities by constituting an expert committee.

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