Dear Members!

Pharmaceutical sciences are an important part of the health care system and have grown since the 20th century, and have been groomed many times since the Pharmacy Act 1948. Skilled pharmacy personnel became a need to fulfill the nation’s healthcare system. Industries are unable to find skilled and specialized professionals. There is a need to fill the gap between the academia and pharmaceutical industry is made. Orientation of B.Pharm to specialized health care personal to fulfill the nation’s need can be achieved by incorporating specialized program as an elective subject in the 7th & 8th semesters or final year viz: pharmacoeconomics, pharmacovigilance, regulatory affairs, pharmaceutical journalism, clinical pharmacy and medical devices, and M.Pharm and has been done by Delhi Pharmaceutical Sciences and Research University, as an elective subject.

2 - Further, to increase the scope of pharmacy, eligibility to many courses like Master of public health, master of hospital administration and master of business administration (pharmaceutical sciences), we made (DPSR University) as B.Pharm eligibility to apply in the above courses, which will help to create new jobs in hospitals & elsewhere.

3 - Social and economic growth have always been closely interlinked with the health care achievements, therefore pharmacy education & practice has a significant role in nation’s health policies. There is greater need for quality pharmacy education and, can be achieved only through improved teaching and training utilizing up to date and relevant curriculum. Direction of research and development must be accordance with national health policy (1983, 2002 and 2015 proposed) to serve the nation in an effective way. Collaborative care, interdisciplinary team based practice and transform the research to commercialization. The best way to transform the pharmacy education - approach is to make practice with human subjects. APTI must concentrate to evolve the research to NHP (1983, 2002 and 2015 proposed) and dynamic changes framed with new specialized centers. DPSR University put forward a valuable step to meet the needs of healthcare system with 13 centers. Centre for Basic Sciences
Any suggestion to improve the newly created “Delhi Pharmaceutical Sciences and Research University” are welcome.

With warm regards

Prof (Dr) S.S. Agrawal
Vice Chancellor and Professor of Pharmacology
Delhi Pharmaceutical Sciences and Research University

On behalf of management, staff and students of A.S.N. College of Pharmacy, it is our great pleasure to host today's IPA A.P State Branch inauguration and induction of its office bearers with the blessings of Dr. Rao V.S.V Vadlamudi, Dr. T.V. Narayana, Dr. T. B. Nair and many other friends and I sincerely welcome all the fellow members and delegates to this one day programme.

It is my great pleasure to present before you the report on IPA A.P State Branch inauguration and induction of its office bearers with the blessings of Dr. Rao V.S.V Vadlamudi, Dr. T.V. N arayana, Dr. T. B. N air and many other friends and I sincerely welcome all the fellow members and delegates to this one day programme.

Dr. T.V. N arayana, President, IPA Education Division, Dr. M.D. Karvekar, Executive Council Member, Pharmacy Council of India and many other fellow Pharmacy fraternity members of this region. My special appreciation and thanks to faculty of Chebrolu Hanumaiah Institute of Pharmaceutical Sciences, M.A.M College of Pharmacy, A.S.N. College of Pharmacy, K.C. Reddy College of Pharmaceutical Sciences for joining their hands to initiate Indian Pharmaceutical Association Andhra Pradesh State Branch. The Total No. of life members enrolled under IPA Guntur Branch has reached 78. With the tremendous response in membership drive and various activities being conducted by this branch, the IPA central council has kind enough to approve IPA Guntur Branch as IPA Andhra Pradesh State Branch w.e.f 24/02/2016.

The following are the programmes organized by IPA Guntur/A.P State Branch during 6th November, 2015 – 31st March, 2016.

On the eve of 54th National Pharmacy Week celebrations, during 20th November to 21st November, 2015 an inter-collegiate Sports and Co-curricular meet was organized at CHIPS on the name of CHIPSOIREE-2015. More than 500 students from various Pharmacy Colleges of this State were participated in this event. Dr. Rayapati Srinivas Ex. M.L.C was the Chief Guest and delivered talk on “Responsible use of antibiotics” on the occasion. Sri N.V. Bhaskara Rao, J.C.E, A.P Pollution Board, Vijayawada, Sri Ch. Ramesh, Chairman, Pioneer Group of Industries were the guests for valedictory and prize Distribution ceremony. The total expenditure incurred for this event is rupees 1.5 lakhs and it was advanced by Chebrolu Hanumaiah Institute of Pharmaceutical Sciences, Guntur.

On the eve of 54th National Pharmacy Week celebrations, on 23rd November, 2015 a dental Health Camp was organized at M.A. M. College of Pharmacy, Narasaraopet. Dr. B. Ram Chand, M.D.S was attended as Chief Guest and treated the patients. The total expenditure incurred for this event is rupees Rs. 15,000/- and it was advanced by M.A.M. College of Pharmacy.

On the Eve of 54th National Pharmacy Week Celebrations on 24th November, 2015 Blood Donation Camp was organized at M.A.M. College of Pharmacy, Narasaraopet. Dr. B. Ram Chand, M.D.S was attended as Chief Guest and treated the patients. The total expenditure incurred for this event is rupees Rs. 15,000/- and it was advanced by M.A.M. College of Pharmacy.
Blood Bank Narasaraopet was attended as Chief Guest. The total expenditure incurred for this event is rupees Rs. 15,000/- and it was advanced by M.A. M. College of Pharmacy.

On 5th December, 2015 a Health Awareness Walk was organized by Chebrolu Hanumaiah Institute of Pharmaceutical Sciences at Potturu Village. The total expenditure incurred for this event is rupees Rs. 25,000/- and it was advanced by Chebrolu Hanumaiah Institute of Pharmaceutical Sciences, Guntur.

On 6th December, 2015 Mega Free Medical Camp was organized by Chebrolu Hanumaiah Institute of Pharmaceutical Sciences at Potturu Village and distributed free medicines to about 650 patients who participated in the camp. Dr. K. Basavapunnaiah President, Nagarjuna Education Society and E.C.M. members of Nagarjuna University had inaugurated the Camp. The total expenditure incurred for this event is rupees Rs. 2 Lakhs and it was advanced by Chebrolu Hanumaiah Institute of Pharmaceutical Sciences, Guntur.

On 23rd February, 2016 community awakening caravan to counter trafficking – Swaraksha Campaign was organized at M.A. M. College of Pharmacy, Narasaraopet. Dr. Kodela Siva Prasad Rao, Hon’ble Speaker, M.A. M. College of Pharmacy, had inaugurated the Camp. The total expenditure incurred for this event is rupees Rs. 1.5 lakhs and it was advanced by M.A. M. College of Pharmacy.

On 13th to 15th February, 2016 Pharma Expo-2K16 was organized by Chebrolu Hanumaiah Institute of Pharmaceutical Sciences. About 2,000 students from various Colleges and Schools were attended the Pharma Expo-2K16. Sri B. Udaya Lakshmi, IAS, Commissioner of Technical Education had inaugurated the Pharma Expo-2K16. The total expenditure incurred for this event is rupees Rs. 70,000/- and it was advanced by Chebrolu Hanumaiah Institute of Pharmaceutical Sciences, Guntur.

On 11th to 12th June, 2016 Department of Biotechnology (DBT), Government of India, sponsored National Workshop on Hands on Advanced Analytical and Emerging Technologies for Biomedical Applications (HAAETBA-2016) was organized by Faculty of Pharmacy, IFTM University, Moradabad on 11-12 June, 2016. The Workshop is a grand success with the presence of delegates including faculty members, research scholars and students of various institutes from all over India. The proceedings of the workshop can be unfolded into six parts. On first day it was the first part included the inaugural session, two scientific sessions including lectures and experiments. Second day consist of two scientific sessions and final part included the valedictory session which marked the end of the academic event.

On first day the inaugural session of the workshop begun at 10.00 A.M. by the Honourable Vice Chancellor Prof. R.M. Dubey with lighting of lamp. A series of short speeches were delivered by the dignitaries which included a welcome speech and a brief insight on the theme of the workshop by Prof. A.K. Ghosh and the key note address by Prof. A.K. Sharma. A continued scientific session was delivered by Prof. Farhan Jalees, Jamia Hamdard University, New Delhi and Dr. P. Chattopadhyay, Scientist-E, DRDO, Tezpur. The lecture session was followed by experiments on various sophisticated analytical instruments which helped the participants to understand their advancement for biomedical applications.

Second day of workshop began with lecture of Dr. S Dixit, Senior Scientist, Jubilant Organosys, J P Nagar and Prof. S. Mishra, IFTM University, Moradabad. Apart from the lecture, experimental sessions were also conducted on HPLC, FTIR, PCR, Electrophoresis-Western blot and Brookfield Viscometer. The participants were enlightened on theory and practical sessions on instrumentation and familiarized with their applications in biomedical analysis.

The workshop concluded with the valedictory program addressed by Dr. Arun Kumar Mishra, Chairman- Organizing Committee wherein the certificates were given to the participants followed by valedictory speech and vote of thanks.

The program was successfully conducted under the guidance of Honourable Vice Chancellor Prof. R. M. Dubey, IFTM University, Moradabad.

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On the eve of International Women’s Health Day (28th May), Periyar Health Club of Periyar College of Pharmaceutical Sciences, Tiruchirappalli organized a guest lecture on 22nd June 2016 at the institution. Dr. T. Shri Vijaya Kirubha, Secretary, Periyar Health Club, welcomed the gathering. Dr. S. M. unavar Sultana, Medical Officer, Periyar Maniammai Dispensary, Trichy delivered an awareness lecture on Women’s health. She enunciated on the main issues regarding women’s health to enshrine their wellbeing. She deliberated on many health concerns that are unique to women at different stages of their lives starting from pre menstrual to post menopausal stage in a lucid manner. She added that the biggest challenges women face is learning how to care for themselves while caring for others and concluded that it is possible for all women to adopt a healthy lifestyle, exercising regularly and eating right amidst their busy schedule, and cultivate the right mindset and build a supportive network to keep them on track.

Principal Prof. (Dr.) G. P. Vadnere, Prof. Mohammed Rageeb, Mohammed Usman, A assistant Professor, and Department of Pharmacognosy, Smt. Sharadchandrika Suresh Patil College of Pharmacy, Chopda, Maharashtra, India on the occasion of Van Mohatsav 2016 (1 July to 7 July 2016) Planted around 300 Plants of various species on 1 July 2016 in Surrounding Area of College Campus by Inviting Hon. MGSM, M anagement, Politicians, Press Reporters, Businessmen, Staff M embers and Students.

On this occasion Dr. A. R. Shabaraya, President, Indian Pharmaceutical Association, Dakshina Kannada district Local branch, M angalore in association with N S S U nit of Srinivas College of Pharmacy, Valachil, M angalore & Srinivas Institute of Dental Sciences, M ukka, Surathkal gave a talk on O ral hygiene. Guest of honour Dr. Kelvin Peter Pais, A stt. Professor, department of Public Health Dentistry Srinivas Institute of Dental Sciences, M ukka, Surathkal gave a talk on O ral health is total health” said chief guest Dr. Lavanya Varma, A ssociate Dean, Srinivas Institute of Dental Sciences, M ukka, Surathkal who inaugurated Dental health Camp organized by Indian Pharmaceutical Association, Dakshina Kannada District, Local Branch, M angalore in association with N S S U nit of Srinivas College of Pharmacy, Valachil, M angalore & Srinivas Institute of Dental Sciences, M ukka, Surathkal on 4th July 2016 at Srinivas College of Pharmacy, Valachil, M angalore.

Oral health is total health” said chief guest Dr. Lavanya Varma, Associate Dean, Srinivas Institute of Dental Sciences, M ukka, Surathkal who inaugurated Dental health Camp organized by Indian Pharmaceutical Association, Dakshina Kannada District, Local Branch, M angalore in association with N S S U nit of Srinivas College of Pharmacy, Valachil, M angalore & Srinivas Institute of Dental Sciences, M ukka, Surathikal on 4th July 2016 at Srinivas College of Pharmacy, Valachil, M angalore.

G ocula Krishna College of Pharmacy, Sullurpet, Nellore, A ndhra Pradesh organized its 1st Indo-U K Seminar on “Pharmaceutical Education and Research: Challenges and Opportunities” in association with Indian Pharmaceutical Association (Education Division) M umbai and J ournal of Comprehensive Pharmacy (JCP) on 9th July, 2016. The seminar was inaugurated by Dr. T.V. N arayana, Vice-President.
Konkan Gyanpeeth Rahul Dharkar College of Pharmacy & Research Institute, Karjat organized “Pharma Career guidance & Placement Summit” on 9th July 2016 with an objective to provide students a platform to know new venues in Pharmaceutical careers, to minimize the gap between industrial/Sales expectation and actual academic output and also to know the present Indian & global pharmaceutical scenario. It was organized in Association with Indian Pharmaceutical Association IPA (MSB), Aassociation of Pharmaceutical Teachers of India, APTI (MSB) and Maharashtra Pharmacists Association. Placement was provided by Gufic Biosciences Ltd. 


Dr. Debesha Das Vice President at Gufic Biosciences Ltd. Mumbai having Experience in Pharmaceutical Sales & Marketing for 20 years delivered PowerPoint presentation talk on Pharmaceutical Industry: Scope & Career Opportunities in QA, QC Bulk drug formulation, export, sales and marketing, medical writing, product development. As per his vision India is expected to become top 5 wrt Global Pharmaceutical Sector by 2025.

Pharma Industry is highly competitive. It is predictable, sustainable & disciplined. Indian Companies & MNCs (70:30) have significant role for growth of industry. Domestic & International players will rule next few decades. Stringent Government regulation & Merger acquisitions will continue to be a part of industry. Huge Scope & opportunities for seasoned & upcoming pharmacy professionals. He elaborated the details about Indian & global Pharma scenario wrt sales and marketing as Indian pharmaceutical growth rate is 14% more than global rate. Present Indian position is 10th but by 2020 India will be 5th. He asked students to work hard but smart with honesty and sincerity to be brand. He suggested students to learn the basics of business to succeed in the Pharma industry.

Mr. Ashwan Pandita, Deputy General Manager Global Clinical Research Operations, Glenmark was an invited speaker at the event. Mr. Pandita provided the students with an insight of various career options for them in the area of Pharmaceutical Research & Development. The students were overwhelmed to know about various areas of Research & Development in the pharmaceutical industry, such as Drug Discovery, Formulation Development, Analytical Research, Biological Research, Pharmacokinetics, Pre-Clinical Research and Clinical Research. The students got an idea of the clinical research as a career option and also got to know about the various processes applied during the conduct of clinical trials. Mr. Pandita spoke in detail about the career opportunities in the Clinical Research domain, including options in the areas of Clinical Operations, Clinical Data Management, Clinical Regulatory Affairs, Pharmacovigilance and Clinical Quality Management. He stressed students to undergo industrial visits regularly.

Abhay Bagesar, Senior Manager Regulatory Affairs (Europe and Canada) at USV Private Limited, delivered talk on Opportunities in
Regulatory Affairs: He emphasized on the interface between Industries & regulatory agencies involved in the registration of the drug products in respective countries prior to their marketing. It provides a unique mix of science & management to achieve commercially important goals. Drug Regulatory Affairs touches everything relating to drugs from the non-clinical studies, through development into routine manufacture and marketing.

He elaborated on the significance of regulatory affairs as from drug development to commercialization. Each step is regulated. RA advises R&D, QC, QA, scale up & production in generating data required for DMF & Dossier preparation. RA prepares, complies and reviews DMF/Dossier.

No DMF/Dossier—No registration—No sale. He suggested students to imbibe qualities of a good RA professional and explore the inner hidden talent of students. He asked to add values & knowledge as well as work with the employer. He urged students to attend CPHL exhibitions and practice ethics.

Dr. Roshan Palewar, International Project Leader - Asia Pacific at Merck Group, elaborated his talks on “Pharmaceutical industry worldwide - An overview”. He introduced details about the Indian Pharmaceutical Industry, Generic drug form the largest segment healthcare, Technology outlook 2020—Technology uptake. The Indian Pharmaceuticals market increased at a CAGR of 17.46 per cent in 2015 from US $ 6 billion in 2005 and is expected to expand at a CAGR of 15.92 per cent to US $ 55 billion by 2020. By 2020, India is likely to be among the top three pharmaceutical market by incremental growth and occupy sixth largest market globally in absolute size. Indian cost of production is significantly lower than that of US and almost half of that Europe. He suggested about new open avenues in Telemedicine, Pharmacogenomic optimized drug therapy, Robotic assisted surgery, Technology assisted drug therapy, & career on the technology. He presented beautiful video graphic presentation on PHARMA Outlook…2020.

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All the B.Pharm, M.Pharm and Pharm-D students of G. Pulla Reddy College of Pharmacy organized “Traditional Day” programme on 16th July 2016. The programme was started by lighting a lamp by the Dr. B. M Adhava Reddy, principal and other staff members. Dr. Veeresh B, Dr. P. K. Laxmi and Principal of the college conveyed the message about the importance of tradition and culture in day to day life. The students dressed in various traditional dresses representing different states of India. The students have actively participated in various traditional dances and games. All the teaching and non teaching staff members were also actively participated in traditional day programme.

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‘Haritha Haram’ programme was organized on 16th July 2016 by G. Pulla Reddy College of pharmacy, Dr. B M Adhava Reddy Principal planted varieties saplings in college premises and convey the message about the importance of Haritha Haram initiated by Government of Telangana. Latter the teaching and non-teaching staff and B.Pharm, M.Pharm and Pharm-D students actively participated and planted various types plants.

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Bharati Vidyapeeth College of Pharmacy, Kolhapur (Maharashtra) Training and Placement Cell had organized workshop cum Training on “Employability Skill Development” Campus 2 Corporate (C2C) National Level Contest of HRCub Mumbai for B. Pharm & M. Pharm students on 16th July 2016 at Bharati Vidyapeeth, College of Pharmacy, Kolhapur.
The inaugural function started with the recitation of the Saraswati Vandana, followed by the lamp lighting ceremony by the dignitaries on the dais, M. R. Shreenivasan Iyer, Director, The H R Club, M umbai, Dr. H. N. M ore (Principal and Chairman Board O f Studies, Shivaji University, Kolhapur), Dr. A. Nikumar J. , Shinde (Training & Placement Officer). M. R. Shreenivasan Iyer said in his talk, due to globalization, tremendous changes in pharma profession, meeting that change, it is necessary to students should develop the skills, which is required for corporate world, and meet the challenges in Pharmaceutical Industry. He also focuses on how to develop general aptitude skills, Group Discussion, Interview skills, Art of speaking, Corporate & Email etiquettes, Team work, motivation skills. Dr. A. A. H ajare, Dr. N. R. J adhav, Dr. S. G. K illedar, Dr. M. R. N. M. Bhatia, Prof. R. J. J arag, Prof. U. S. Patil, Prof. R. P. D hvale, Dr. D. A. B hagwat and all the faculty members and students were present on the occasion.

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20th July, 2016

A ssociation of Pharmacy Professionals (APP) A ndhra Pradesh State Branch organized 2nd Indo-West Indies Conference on ‘Global Research Trends and Challenges in Pharmaceutical Sciences’ on 20th July 2016 at V. V. Institute of Pharmaceutical Sciences, Gudlavalleru, Krishna District, Andhra Pradesh. Event was witnessed by Prof. K. R. S. Sambasiva Rao, Rector (Pro-Vice Chancellor), A charya N agarjuna U niversity, G untur as ‘Chief Guest’; Dr. Madan Mohan Gupta, Senior Lecturer (Pharmaceutics), School of Pharmacy, Faculty of Medical Sciences, The University of the West Indies; Dr. A. Lakshman Rao, Principal and Professor, V. V. Institute of Pharmaceutical Sciences, Gudlavalleru were conferred with ‘APP Appreciation Awards’. Dr. C. Y. S. Chakradhar, V. V. Institute of Pharmaceutical Sciences, Gudlavalleru was conferred with ‘APP Outstanding Achievement Award 2016’ for her vital contribution in the pharmacy profession. Dr. Sambasiva Rao was conferred with ‘A PP O utstanding Achievement A ward 2016’ in the memory of Late C hennupati Siva R ama Krishnaiah, father of A PP-A P State Branch President, for his vital achievements throughout the career.

Conference was attended and papers were presented in ‘poster’ session by more than 250 delegates from different universities and institutions all over south India. Dr. Rajya Lakshmi from Vignan Pharmacy College, Vadlamudi and Dr. Venkateswara Rao from A ditya Pharmacy College, Surampalem, East Godavari District acted as ‘Judges’ for the scientific poster session during the A PP 2nd Indo-West Indies Conference. During the valedictory function, Dr. M adan M ohan G upta, Senior Lecturer (Pharmaceutics), School of Pharmacy, Faculty of Medical Sciences, The University of the West Indies; Dr. A. Lakshman Rao, Principal and Professor, V. V. Institute of Pharmaceutical Sciences, Gudlavalleru were conferred with ‘A PP A preciation A wards’. Dr. T. Sarita J yostna was nominated as ‘Secretary’ for A PP Telangana State Branch 2016. Dr. J ithan V enkata A ukunuru was promoted to Vice President, A PP Telangana State Branch and the certificate was presented by President, A PP A P State Branch during the valedictory function of the conference.

At the end, M. S. S. Vidya Sree from Vignan Pharmacy College, Vadlamudi; M. R. D. Santhosh Kumar, K.V.S.R. Siddhartha College of Pharmaceutical Sciences, Vijayawada; M. R. S. Chakradhar, V. V. Institute of Pharmaceutical Sciences, Gudlavalleru; M. R. Sk. M ujafar, K. C. Reddy Institute of Pharmaceutical Sciences, Guntur; M. S. Ch. Neelima, Vignan Pharmacy College, Vadlamudi and M. K. Jaya Bharathi, V. V. Institute of Pharmaceutical Sciences, Gudlavalleru bagged 1st and 2nd positions in poster presentation competition. Aiso, consolation prizes were given to M. R. P. Sridhar, Department of Chemistry, VIT University, Vellore and M. S. D. Sunanda, K. C. Reddy Institute of Pharmaceutical Sciences, Guntur, A ndhra Pradesh.
ABSTRACT
Skill intensive industries, such as manufacturing and services, are expected to contribute more than 90% of India's GDP by 2030. Hence skill development has been taken as a priority project by the present Government, led by our worthy Prime Minister, Mr Narendra Modi. Whilst countries such as Brazil, China, Germany, Switzerland, UK, Canada, US, Japan and S. Korea boast of between 50-97% of their workforce being skilled, India's skilled workforce is under 5%. This dismal situation is driven by factors like out-dated academic curricula, shortage of quality faculty, high student-teacher ratio, lack of Institutional-industry linkages and lack of autonomy to introduce new and innovative courses. It is the same situation in thousands of pharmacy institutions and education imparted by them. The unskilled pharmacy students are being avoided by the employers. The situation needs to be changed urgently and the level of skills of pharmacy students is required to be enhanced to help them enter active life, the world of work, and society, which is becoming extremely competitive day-by-day. What is required is a paradigm shift, from a “supply stipulated” model to a “demand determined” model, so that those joining the jobs are better skilled and ready from the day one. The author suggests taking learning from the efforts being done by Life Sciences Sector Skill Development Council (LSSSDC) and Healthcare Sector Skill Council (HSSC), which are duly engaged in creating a robust and vibrant ecosystem for development of skilled workforce matching globally recognized standards benefiting stakeholders in pharmaceutical, biotechnology, clinical research and healthcare space.

Key words: Skill development, Pharmaceutical education, LSSSDC, HSSC

INTRODUCTION
In the last few years, there has been spurt in the number of pharmacy colleges in the country, which is touching now to ~2000. Due to absence of quality infrastructure and trained faculty in most colleges, standards of instructions and training have suffered significantly, as a result of which only few of 1.5 lac students graduating every year can be considered worthy of good employment. In fact, +2 science students all over the country are losing interest to join pharmacy programs as pharmacy graduates passing out from so called 'only-for-profit' institutions are treated as cheap labor in the hands of employers, particularly the pharmaceutical industry. It is one major reason that seats in most pharmacy colleges are remaining unfilled year after year, and the managements are forced to adopt malpractices to ensure minimum number of students, which is must for survival of the institution itself.

A suggestion to change the situation was given by the author recently, whereby emphasis was made on extension of the concept of Quality-by-Design (QbD) to pharmaceutical education. QbD, as applicable to industry, aims to build quality into the finished product, without reliance on end testing. Similarly, QbD in education (QbDE) would mean building quality in students through changes at both macro and micro levels. At the macro level, QbDE emphasizes on establishment of policies, procedures and controls so that all institutions have similar high quality infrastructure, facilities and faculties so as to produce highly trained students. At the micro level, it tends to focus upon a teaching and training program that aims at all students in a class having similar knowledge and skill set and hence employability, despite that students may be belonging to different backgrounds, levels of intelligence, and capacity to learn.

Therefore, according to QbDE, the role of education is not only to impart knowledge to the students, but also to develop skill in them so that they are able to secure a respectable job. A very big question here is whether we in academia understand the word meaning of the term 'Skill' in real sense? Is 'Skilling' same as 'education' or it is different? Another related question is: whether pharmaceutical education of today is really oriented towards imparting skills to students? If not', then a bigger question would be - what needs to be done, so that pharmacy students are sought favorably by the employers?

This write-up seeks to answer these and multiple other questions relevant
to 'skill' and its 'development' in relation to pharmaceutical education.

**QUESTIONS AND ANSWERS**

1. What is definition of the word 'Skill'?
   It is defined as the abilities that one possesses.

2. What are its types?
   Skill is of two types: Domain general and domain specific. Domain general skills involve soft skills, time management, teamwork and leadership, self motivation, etc. Domain specific abilities are the ones useful for a specific job.

3. What is skill development?
   Development of domain-general and domain-specific abilities of any individual.

4. Is skill development akin to education and training?
   Not exactly.

5. Does pharmaceutical education encompass skill development?
   Not really.

6. Why so?
   Pharmaceutical education, as being provided today, neither helps in development of domain-general nor domain-specific (job-specific) skills.

7. Reason?
   Our education system is not job targeted, so there is no orientation towards skill development. A pharmacy graduate/postgraduate, after spending 6 years in college, doesn't really know for what job he/she is skilled for, so lands up in job market absolutely raw.

8. Any more reasons?
   Pharmacy curriculum as of today is oriented towards multiple theory subjects, followed by very limited practical training. There is emphasis on 'teach everything, leave nothing'. There is lack of industry-academia interaction, lack of quality teachers, and lack of training infrastructure in most colleges.

9. How many are the job roles for pharmacy students?
   By an estimate > 100.

10. Is student from any pharmacy institution truly skilled for any Domain-specific job out of the > 100 job roles available?
   It is a rarity. Only few institutions, perhaps at post-graduate level, develop skill in students that is directly needed by the employer.

11. Is it for this reason that industry as such does not prefer to hire pharmacy students?
   Surely, the preference is moving towards science graduates, who can be hired with less pay package and can be equally trained in-house.

12. Is pharmacy student treated as a cheap labor?
   Yes! A s low qualified pharmacy students are available in plenty annually (~ 1.5 lacs), therefore, industry and other employers take advantage by treating them as cheap labor.

13. Options to change the situation?
   Yes, multiple possibilities exist like rationalizing intake of students and number of colleges, increasing industry-academia interaction, revising curricula to have emphasis on skill development, and implementing QbDE.

14. What new and additional can be done to enhance job prospects of pharmacy students?
   Take inputs from efforts by LSSSDC.

15. What is LSSSDC?
   Life Sciences Sector Skill Development Council, which has been set up by Confederation of Indian Industry (CII) in cooperation with National Skill Development Corporation India (NSDC) under Ministry of Skill Development and Entrepreneurship.

16. When was LSSSDC operationalized?
   1 August, 2014, after the new Government took over. Skill development was taken as a priority project of the Government of India (GOI), as announced by Sh. Narendra Modi, Hon'ble Prime Minister of India, in his Independence-day speech from Red Fort on 1 August 2014. He stated: “Skilling is building a better India. If we have to move India towards development, then Skill development should be our mission”.

17. Who governs LSSSDC?
   The governing body of LSSSDC is chaired by Mr Satish Reddy, Chairman, Dr Reddy’s Research Laboratories (DRL) and represented by Indian Pharmaceutical Alliance (IPA), O PPI, IDMA, BDM, Pharmexcil, CPI, A BLE, A CRO, Indian Pharmaceutical Association, N IPER (Hyderabad), DIPSAR, and Ministry of Commerce. The council is manned by a Chief Executive Officer; Director, N O S & Curriculum Advisor; Director, Assessment; Accreditation & Certification; Manager, Marketing & Stakeholder Management and assisting staff.
18. Mission of LSSSDC?

To create a robust and vibrant ecosystem for development of a skilled workforce matching globally recognized standards benefiting all stakeholders in pharmaceutical, biotechnology and clinical research space.

19. What are activities of LSSSDC?

i) Develop, with industry support, National Occupation Standards (NOS) and Qualification Packs (QPs)

ii) Develop curriculum and content, which match the standards for individual job roles

iii) Accreditation of training partners

iv) Conducting ‘Train The Trainers (TTT)’ programs

v) Assessment and certification of those undergoing skilling

vi) Facilitation of placements

Leveraging presence of all active Associations on its Governing Body, LSSSDC has forged a strong connect with a cross section of Pharmaceutical Industry, including the top 20 companies. The latter have been contributing to NOS validations, curriculum/content development, providing master trainers for TTT program and other activities.

20. How to understand National Occupational Standards and Qualification Packs?

According to LSSSDC, NOS specify the standard of performance that an individual must achieve when carrying out a function in the workplace, together with the knowledge and understanding needed to meet that standard consistently. Each NOS defines one key function in a job role. It is a concise and readable document, usually consisting of no more than five or six pages (some are only one or two). NOS always have measurable outcomes as “Performance Criteria”. NOS are not courses, training programs, units or qualifications. These are rather benchmarks of good practice, description of functions, standards of performance and knowledge/understanding. These are developed or laid out by or with involvement of employers. A set of NOS, aligned to a job role, called QP, is made available for every job role. Each QP is benchmarked at National Standard for Qualification Framework (NSQF). A QP aligned to NSQF drives both the creation of a course, curriculum & content, and assessments. Thus NSQF makes it possible to drive competency/outcome based training and assessment for every job role in industry. In addition to the creation, delivery and assessment of skilling program, QPs can be used by employers for recruitment, performance appraisals and deriving the training needs for upskilling programs. The concept is further explained in Fig. 1 (http://lsssdc.in/Document/QP-Documents.pdf).

21. Job roles targeted by LSSSDC?

LSSSDC, along with KPMG, has identified 61 job roles in Pharma, Biotechnology and Clinical Research space (Table 1), which comprise 90% of total current job volume of approximately 8 lacs. Of the 61, major 4, viz., Production/Manufacturing chemists, QA chemists, QC chemists, and Medical sales representatives (MSR), account for 35% of job volume of the sector. MSR, comprising 25% of job volume of sector, is by far the single biggest job role. Skilling has begun in 3 of these job roles.

22. Qualification packs developed and industry validated till date?

Till date 33 QPs, representing over 80% of job volume of sector, have been validated by Industry and are now classified as NOS. These are available on NSDC and LSSSDC websites, and are assessable to Training Partners for skilling. LSSSDC expects to complete industry validation of QPs and NOS for remaining job roles within very near future.

With an eye to the future, and participating a NSDC led, UK India Education and Research Initiative (UKIERI) funded project, LSSSDC mapped major 6 QPs, with those of UK. This revealed that in most cases there was 90% or more fit. Importantly, the exercise will result in development of “Transnational Standards” for these 6 job roles. MNCs can avail of this for those needed to be skilled to International standards, for placement overseas.

23. Content of typical QP/NOS?

Figure 2 gives glimpse of QP document for Production/Making chemist. Figure 3 gives an example of core/generic and professional skills required by a person, in particular, with respect to supervision of production. Similar details are outlined for other job skills for the same O occupation at the LSSSDC website: http://lsssdc.in/Document/Production-Chemist.pdf.

24. When a person is certified as skilled?

After completion of the structured skill training of 2-3 months duration, consisting of both practical and classroom training, a professional 3rd party (An assessment Agency) conducts an assessment, based on qualification and curriculum/content, developed with inputs from Industry. Those declared pass are subsequently certified by LSSSDC.
Fig. 1. Understanding Qualification Pack concept

Life Sciences Sector Skill Development Council, India

SELF HELP DOCUMENT for Understanding QUALIFICATION PACK

Structure of a Typical Qualification Pack

Qualification Pack/ QP (Job Role)

(It is cluster of Key functional responsibilities required to perform a job role)

NOS 3

National Occupational Standards
(It is a single function in the job)

NOS (Code)

NOS 2

Performance Criteria
(PC 1, PC 2...)

(These are activities done by role holder to perform his/her functional responsibilities)

Assessment Criteria
The Performance Criteria becomes the assessment criteria of performance. Also act as base of evaluation at Job / post skilling (bifurcated in Theoretical knowledge and application of knowledge and skills in practice. The certification assessment is done based on performance of a candidate on these

Knowledge & Understanding (K)

The Knowledge required by role holder to perform activities (PC) to accomplish goal of function (NOS)

Skill (S)
The Skills required by role holder to perform activities (PC) to accomplish goal of function (NOS)

A) Organisational Context (KA1, KA2...) e.g. For Medical Sales Rep
- Industry Overview
- Typical Organisation
- Organisational Behaviour
- Org. Structure
- Policies

B) Technical Knowledge (KB1, KB2...)
- Human Anatomy
- Therapeutic Area
- Product knowledge
- Health Ecosystem
- Selling technique

A) Core Skills / Generic Skills (SA1, SA2...)
- Writing Skills
- Reading Skills
- Oral Communication (Listening & Speaking Skills)

B) Professional Skills (SB1, SB2...)
- Decision Making
- Plan & Organise
- Problem Solving
- Analytical Thinking
- Critical Thinking
- Objection Handling
Introduction

Qualifications Pack - Production/ Manufacturing Chemist – Life Sciences

SECTOR: LIFE SCIENCES

SUB-SECTOR: PHARMACEUTICAL

OCCUPATION: MANUFACTURING

REFERENCE ID: LFS/Q1201

ALIGNED TO: NCO-2004/2113.0701

Production Chemist, also known as Manufacturing Chemist, is responsible for effective production of sustainable, compliant, quality products.

Brief Job Description: Production Chemist directs factory workers and supervises the defined production process to ensure that the desired product yield is achieved. They utilize their technical expertise on the manufacturing process, machine operation and support in as well as record deviations, incidents, OOS, OOT and change control and coordinate with QA and QC team for reports. They provide feedback to the production operators and assist in developing new methods to work in a more efficient manner.

Personal Attributes: The individual should have good knowledge of production process, GMP and must demonstrate attention to detail and proactive behaviour. The individual should have good planning and execution skills and should be able to anticipate and identify any bottlenecks for the production process.

<table>
<thead>
<tr>
<th>Job Role</th>
<th>Production/ Manufacturing Chemist - Life Sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role Description</td>
<td>Responsible for effective production of sustainable, compliant, quality products.</td>
</tr>
<tr>
<td>NSQF level</td>
<td>4</td>
</tr>
<tr>
<td>Minimum Educational Qualifications</td>
<td>B.Pharm preferable/Graduate in Science (chemistry specialization preferable for Pharmaceuticals)/ B.Tech in chemistry</td>
</tr>
<tr>
<td>Maximum Educational Qualifications</td>
<td>M. Pharm / Masters in science (chemistry specialization preferable for Pharmaceuticals)</td>
</tr>
<tr>
<td>Training (Suggested but not mandatory)</td>
<td>On the job training (1 year of training for entry level chemist is mandatory), GMP training (Mandatory)</td>
</tr>
<tr>
<td>Minimum Job Entry Age</td>
<td>19 Years</td>
</tr>
<tr>
<td>Experience</td>
<td>Fresher, no prior experience required for B. Pharma / M. Pharma / M.Sc. 1-3 years of experience for others</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Applicable National Occupational Standards (NOS)</th>
<th>Compulsory:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. LFS/N0203 Supervise production process</td>
<td></td>
</tr>
<tr>
<td>2. LFS/N0101 Maintain a healthy, safe and secure working environment in the life sciences facility</td>
<td></td>
</tr>
<tr>
<td>3. LFS/N0210 Coordinate with Shift Supervisor, cross functional teams and within the team</td>
<td></td>
</tr>
<tr>
<td>Optional:</td>
<td>N.A.</td>
</tr>
</tbody>
</table>
**LFS/N0203: Supervise Production Process**

<table>
<thead>
<tr>
<th>Unit Code</th>
<th>LFS/N0203</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Title</td>
<td>Supervise Production Process</td>
</tr>
<tr>
<td>Description</td>
<td>This NOS is about a Production Chemist performing the required activities to effectively supervise the production process.</td>
</tr>
</tbody>
</table>
| Scope | This unit / task covers the following:  
Provide the production schedule and necessary guidelines to production operators to handle production activities on a daily basis to achieve target performance  
Communicate directions basis defined SoPs for junior chemists/production operators that include the proper ingredients, temperatures, pressure and mixing times for each step in the production process as per defined SoPs  
Review documentation of all activities to ensure compliance to the process for future reference  
Record the production output for each shift operation in the Batch Process Report as per the approved guidelines of respective Drug Administration Body (MHRA, USFDA, CDSCO, IDRA, India FDA etc.)  
Ensure that all the in-process checks are carried out and quality of the product is ensured at each stage as per the Standard Operating Procedures and other statutory requirements  
Communicate any equipment breakdown to maintenance team without any delay including monitoring the status and type of breakdown, CAPA if required.  
Maintain GMP standards at shop floor and conditions suitable for production of quality products as per requirement |

**Performance Criteria (PC) w.r.t. the Scope**

<table>
<thead>
<tr>
<th>Element</th>
<th>Performance Criteria</th>
</tr>
</thead>
</table>

Fig. 3. Partial list of skills expected from a person responsible for supervising production process  
(http://lsssdcl.org/Document/Production-Chemist.pdf)
Table 1. List of job roles identified by LSSSDC for development of CP and NOS. Serial Nos. 1 to 33 (in bold) have already been developed, while others are under industry validation (http://lsssdc.in/Nos.aspx)

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Job Role</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Production/M Manufacturing Chemist</td>
<td>LFS/Q 1201</td>
</tr>
<tr>
<td>2.</td>
<td>QA Chemist</td>
<td>LFS/Q 0302</td>
</tr>
<tr>
<td>3.</td>
<td>QC Chemist</td>
<td>LFS/Q 1301</td>
</tr>
<tr>
<td>4.</td>
<td>Medical Sales Representative</td>
<td>LFS/Q 0401</td>
</tr>
<tr>
<td>5.</td>
<td>Lab Technician/Assistant</td>
<td>LFS/Q 0509</td>
</tr>
<tr>
<td>6.</td>
<td>Environment, Health and Safety M anager</td>
<td>LFS/Q 0214</td>
</tr>
<tr>
<td>7.</td>
<td>Fitter Mechanical</td>
<td>LFS/Q 0213</td>
</tr>
<tr>
<td>8.</td>
<td>Production/Machine Operator</td>
<td>LFS/Q 0207</td>
</tr>
<tr>
<td>9.</td>
<td>Maintenance A ssistant</td>
<td>LFS/Q 0215</td>
</tr>
<tr>
<td>10.</td>
<td>Maintenance Supervisor/In Charge - Electricity</td>
<td>LFS/Q 0208</td>
</tr>
<tr>
<td>11.</td>
<td>Maintenance Supervisor/In Charge - HVAC</td>
<td>LFS/Q 0209</td>
</tr>
<tr>
<td>12.</td>
<td>Maintenance Supervisor/In Charge - Steam</td>
<td>LFS/Q 0212</td>
</tr>
<tr>
<td>13.</td>
<td>Maintenance Supervisor/In Charge - Water</td>
<td>LFS/Q 0210</td>
</tr>
<tr>
<td>14.</td>
<td>Manufacturing A ssistant</td>
<td>LFS/Q 0216</td>
</tr>
<tr>
<td>15.</td>
<td>Packaging A ssistant</td>
<td>LFS/Q 0217</td>
</tr>
<tr>
<td>16.</td>
<td>Packaging Supervisor/In Charge M achine</td>
<td>LFS/Q 0204</td>
</tr>
<tr>
<td>17.</td>
<td>Packaging Supervisor- M anual and M achine P acking</td>
<td>LFS/Q 0205</td>
</tr>
<tr>
<td>18.</td>
<td>Production Planning Supervisor/In Charge/ Engineer</td>
<td>LFS/Q 0206</td>
</tr>
<tr>
<td>19.</td>
<td>Production Supervisor/In Charge</td>
<td>LFS/Q 0203</td>
</tr>
<tr>
<td>20.</td>
<td>QA Chemist - Equipment Validation</td>
<td>LFS/Q 0312</td>
</tr>
<tr>
<td>21.</td>
<td>QA Chemist- Process Validation</td>
<td>LFS/Q 0303</td>
</tr>
<tr>
<td>22.</td>
<td>QC A ssistant - Visual Inspection/Visual Inspector</td>
<td>LFS/Q 0310</td>
</tr>
<tr>
<td>23.</td>
<td>Quality M anagement System In Charge</td>
<td>LFS/Q 0311</td>
</tr>
<tr>
<td>24.</td>
<td>Research Associate Technology Transfer/Process D evelopment</td>
<td>LFS/Q 0511</td>
</tr>
<tr>
<td>25.</td>
<td>SCM Executive</td>
<td>LFS/Q 0610</td>
</tr>
<tr>
<td>26.</td>
<td>Stability Specialist</td>
<td>LFS/Q 0304</td>
</tr>
<tr>
<td>27.</td>
<td>Store A ssistant</td>
<td>LFS/Q 0604</td>
</tr>
<tr>
<td>28.</td>
<td>Supply Chain M anager</td>
<td>LFS/Q 0611</td>
</tr>
<tr>
<td>29.</td>
<td>Validation Supervisor</td>
<td>LFS/Q 0305</td>
</tr>
<tr>
<td>30.</td>
<td>Vendor and Internal A udIt In Charge</td>
<td>LFS/Q 0306</td>
</tr>
<tr>
<td>31.</td>
<td>Quality Control Chemist- Microbiology</td>
<td>LFS/Q 0308</td>
</tr>
<tr>
<td>32.</td>
<td>Quality Control Chemist- Batch Release Testing</td>
<td>LFS/Q 1302</td>
</tr>
<tr>
<td>33.</td>
<td>Quality Control Chemist- Packaging</td>
<td>LFS/Q 1303</td>
</tr>
<tr>
<td>34.</td>
<td>Associate Brand M anager</td>
<td>LFS/Q 0405</td>
</tr>
<tr>
<td>35.</td>
<td>Bio Process Engineer</td>
<td>LFS/Q 0219</td>
</tr>
<tr>
<td>36.</td>
<td>Business Development Executive</td>
<td>LFS/Q 0402</td>
</tr>
<tr>
<td>37.</td>
<td>Clean Room Engineer</td>
<td>LFS/Q 0218</td>
</tr>
<tr>
<td>38.</td>
<td>Clinical Research A ssociate</td>
<td>LFS/Q 0503</td>
</tr>
<tr>
<td>39.</td>
<td>Coordination M anager</td>
<td>LFS/Q 0605</td>
</tr>
<tr>
<td>40.</td>
<td>Data Entry O perator/ Documentation O ficer</td>
<td>LFS/Q 0510</td>
</tr>
<tr>
<td>41.</td>
<td>Demand Planning M anager</td>
<td>LFS/Q 0606</td>
</tr>
<tr>
<td>42.</td>
<td>Drug Regulatory A ffairs C hemist</td>
<td>LFS/Q 0501</td>
</tr>
<tr>
<td>43.</td>
<td>Export Logistics M anager</td>
<td>LFS/Q 0607</td>
</tr>
<tr>
<td>44.</td>
<td>Import Logistics M anager</td>
<td>LFS/Q 0608</td>
</tr>
<tr>
<td>45.</td>
<td>Licensing M anager</td>
<td>LFS/Q 0609</td>
</tr>
<tr>
<td>46.</td>
<td>Maintenance Supervisor/In Charge - G ases</td>
<td>LFS/Q 0211</td>
</tr>
<tr>
<td>47.</td>
<td>Market Research Specialist</td>
<td>LFS/Q 0403</td>
</tr>
<tr>
<td>48.</td>
<td>Production/M Manufacturing Biologist</td>
<td>LFS/Q 2201</td>
</tr>
<tr>
<td>49.</td>
<td>QC Biologist</td>
<td>LFS/Q 2301</td>
</tr>
<tr>
<td>50.</td>
<td>QC Biologist - Batch Release Testing</td>
<td>LFS/Q 2303</td>
</tr>
<tr>
<td>51.</td>
<td>QC Biologist - Packaging</td>
<td>LFS/Q 2302</td>
</tr>
<tr>
<td>52.</td>
<td>Regulatory M edical Writer</td>
<td>LFS/Q 0504</td>
</tr>
<tr>
<td>53.</td>
<td>Research A ssociate/ A ssociate Scientist - Product Development</td>
<td>LFS/Q 0505</td>
</tr>
<tr>
<td>54.</td>
<td>Scientific M edical Writer</td>
<td>LFS/Q 0506</td>
</tr>
<tr>
<td>55.</td>
<td>Scientist Clinical Research Development</td>
<td>LFS/Q 0507</td>
</tr>
<tr>
<td>56.</td>
<td>Sourcing Lead and Vendor Development</td>
<td>LFS/Q 0613</td>
</tr>
<tr>
<td>57.</td>
<td>Store Chemist/Supervisor/In Charge - Finished Goods</td>
<td>LFS/Q 0603</td>
</tr>
<tr>
<td>58.</td>
<td>Store Chemist/Supervisor/In Charge - Packaging M aterials</td>
<td>LFS/Q 0602</td>
</tr>
<tr>
<td>59.</td>
<td>Store Chemist/Supervisor/In Charge - Raw M aterials</td>
<td>LFS/Q 0601</td>
</tr>
<tr>
<td>60.</td>
<td>Supply Planning M anager</td>
<td>LFS/Q 0612</td>
</tr>
<tr>
<td>61.</td>
<td>Telesales Executive</td>
<td>LFS/Q 0404</td>
</tr>
</tbody>
</table>
25. LSSSDC accomplishments to date?

As of date, LSSDC has 4 assessment agencies, 160 assessors, and 260 "certified trainers". The Council has conducted 28 TTT programs, through which over 4,000 persons have been certified skilled. It is conducting MSR skilling on Pan India basis, having accredited almost 100 training partners across 20 states. A total of 15,600 persons have been enrolled for MSR skilling.

LSSSDC is also going to make available e-content on a mobile application for currently employed MSRs to facilitate up-skilling, under an initiative termed "Skilladder", details of which are available on LSSSDC website.

For other 3 technical job roles, LSSSDC is focusing on multiple clusters of Pharma activity spread over 5 states. These are Baddi at Himachal, Bengaluru at Karnataka, Hyderabad/Vizag in Telangana/A.P, Mahrashtra and Gujarat. Major Industry partners already have come on board at Baddi, Hyderabad and Bengaluru. Skilling has commenced at Baddi and Hyderabad, and Training Partner(s) identified at Bengaluru. Importantly, the training imparted will be a combination of classroom and practical, again through Industry involvement.

Cadila has accredited their 'in house' training centres with LSSSDC. Those being skilled will be assessed by LSSSDC appointed Assessment Agencies, and subsequently certified by LSSSDC, for final placements within Cadila, and other organisations.

For other technical job roles, LSSSDC is focusing on multiple clusters of Pharma activity spread over 5 states. These are Baddi at Himachal, Bengaluru at Karnataka, Hyderabad/Vizag in Telangana/A.P, Mahrashtra and Gujarat. Major Industry partners already have come on board at Baddi, Hyderabad and Bengaluru. Skilling has commenced at Baddi and Hyderabad, and Training Partner(s) identified at Bengaluru. Importantly, the training imparted will be a combination of classroom and practical, again through Industry involvement.

Majors in other states, such as DRL, Abbott, Sentis, Fresnius, Ranules, Cipla, Glenmark, Biologicals E will be hiring the first batches of candidates certified by LSSSDC. Numerous others have signed MoUs with LSSSDC for placements.

26. The role of Health Care Sector Skill Council?

The job role of a pharmacist is crucial, and as it was not covered by LSSSDC, the same has been taken up by the Health Care Sector Skill Council (HSSC). HSSC has established QP and NOS for Pharmacy Assistants, a position meant for D.Pharm., B.Pharm. and PharmD students.

27. Difference of this model from classroom pharmacy education?

In class, the courses are not taught in the manner envisaged by LSSSDC (or HSSC). Hence employers cry that students produced by academic institutions are not really suitable and they need to be extensively re-trained.

28. How this skilling effort of GOI can be integrated with pharmaceutical education?

Curriculum and content developed by LSSSDC and HSSC for multiple job roles can be incorporated by revising D.Pharm., B.Pharm., and M. Pharm. syllabi by deleting less important and obsolete topics.

29. What are possible suggestions on this?

i) Offer QPs to students as electives in the last two or final semester(s).

ii) Faculty shall be sent for the TTT program of LSSSDC or HSSC.

iii) Different institutions can offer electives in different and select job roles.

iv) Students can choose an elective, and even institution based on their job preference.

v) All leading institutions shall become training partners of LSSSDC or HSSC.

30. In the same context, what are the features of MoU signed between Dr Reddy's Laboratories (DRL) with LSSSDC and Vishnu Institute of Pharmaceutical Education and Research (VIPER) in December 2015?

According to Pharmabiz (www.pharmabiz.com) dated December 07, 2015: “The Memorandum of Understanding (MoU) is aimed at fostering market research collaboration between LSSSDC and industry partners, that in turn will help align educational courses to industry requirements. The MoU will also collaborate to create Pharmaceutical, Biotechnology and Clinical Research occupation standards, as well as establish a competency matrix for job roles in the pharmaceutical sector. The partnership is aimed at addressing the shortage of skilled and certified manpower in the industry, and will help in establishing the framework for long-term collaboration between the council and industry. The partnership will also help strengthen the skilled labour pool and create standards for certification and accreditation, as per the requirements of the Life Sciences sector. On entering into the partnership, Satish Reddy, Chairman of DRL and LSSSDC, said, ‘Skill intensive industries such as the pharmaceutical Life Sciences sector, are poised to contribute significantly to India’s GDP growth in the coming years. It is paramount for us to create a strong foundation of highly skilled resources to support this growth. Our collaboration with LSSSDC and VIPER will go a long way in developing the right talent pool of skills, in line with the future needs of the Indian industry.’ The MoU between DRL, LSSSDC and VIPER is expected to pave the way for entire life sciences industry.
in Telangana and Andhra Pradesh regions to develop a skilled workforce for technical job roles, from as early as 2016."

31. Benefits for pharmacy students?

While technical knowledge for the job role is developed in initial semesters, skill oriented electives in final semesters will prepare them for placement and a sought-after person by the employer.

32. Any role of statutory and professional bodies?

Surely, a larger effort is called for, considering that there is huge annual output of ~1.5 lacs pharmacy students from ~ 2000 institutions. First, critical thinking is required by regulatory agencies and professional bodies with respect to rationalizing the number of institutions, yearly output of students, redesigning of the curricula, enhancement of quality standards of institutions, training of trainers, and development of skill development centers. While industry associations like IDMA, BDMA and Pharmexcil are already participating in the activities of LSSSDC, the grand target set by GOI cannot be met unless regulatory bodies, viz., AICTE and PCI, and professional bodies, e.g., IPA, IPGA, IHPA, APTI and AIDCOC, which represent different job roles, not covered presently by LSSSDC or HSSC (like teaching, drug regulation, etc.) show keen interest and join hands in this gigantic task.

CONCLUSION

There is a need for all-round effort so that every pharmacy student is able to secure a respectable placement before leaving the campus. Only then they are expected to become growth drivers for Pharma/Life Sciences/Clinical Research sector, which in turn will help fulfill skilled persons target set by GOI, and indirectly help country to grow economically and be best in the world. In this context QPs and NOS designed by LSSSDC, which define training and experience required for various job roles in Industry, can be very valuable inputs for pharmacy institutions in the country to fall back upon. Some of the institutions have already fruitfully partnered with LSSSDC, and it might be good for others to also look for the same. Aternately, professional bodies responsible for defining curriculum for pharmacy courses shall consider possibility of integrating QPs and NOS as part of regular degree programs.

ACKNOWLEDGEMENTS

The author appreciates President, Secretary and C chairman, Scientific Services Committee, IPCA, for inviting him to address the participants of 67th Indian Pharmaceutical Congress held at JSS University, Mysuru from 19-21 December 2015. A cknowledgement is also due to M r Ranjit M adan, CEO, LSSSDC for very valuable inputs on Council activities.

CONFLICT OF INTEREST

The author reports no conflict of interest.

ABBREVIATIONS

ABLE: Association of Biotechnology Led Enterprises
ACRO: Association of Clinical Research Organization
AICTE: All India Council of Technical Education, New Delhi
AIDCOC: All India Drug Control Officers' Confederation
APTI: Association of Pharmaceutical Teachers of India
BDMA: Bulk Drug Manufacturers Association (India)
CII: Confederation of Indian Industry
CIPI: Confederation of Indian Pharmaceutical Industry
DIPSAR: Delhi Institute of Pharmaceutical Sciences and Research
DRL: Dr Reddy's Laboratories
GOI: Government of India
HSSC: Healthcare Sector Skill Council (HSSC)
IDMA: Indian Drug Manufacturer's Association
IHPA: Indian Hospital Pharmacists' Association
IPA: Indian Pharmaceutical Alliance
IPCA: Indian Pharmaceutical Congress Association
IPGA: Indian Pharmacy Graduates Association
LSSSDC: Life Sciences Sector Skill Development Council
MoU: Memorandum of Understanding
MSR: Medical Sales Representative
NIPER: National Institute of Pharmaceutical Education and Research
NOS: National Occupation Standards
NSDC: National Skill Development Corporation
NSQF: National Standard for Qualification Framework
OPPI: Organisation of Pharmaceutical Producers of India
PCI: Pharmacy Council of India, New Delhi
Pharmexcil: Pharmaceuticals Export Promotion Council of India
Summary

- Skill and skill development defined.
- As compared to 1980s, there is uncontrolled spurt in number of pharmacy colleges, with only few institutions having infrastructure and experienced faculty members to train and teach the students.
- The unsettled situation has resulted in malpractices by college managements and also students have been rendered cheap labor.
- A possible way-out is extension of quality-by-design (QbD) concept to pharmaceutical education.

About Author

Dr Saranjit Singh: Is Ex-Dean and Professor and Head of the Department of Pharmaceutical Analysis at the National Institute of Pharmaceutical Education and Research (NIPER) at S.A.S. Nagar, Panjab. He is Member, Expert Advisory Panel on the International Pharmacopoeia and Pharmaceutical Preparations, World Health Organization (WHO), Geneva. His research interests include drug stability testing, and drug degradation/metabolite profiling using sophisticated hyphenated techniques like LC-MS and LC-NMR.
Shri Siddharudha. M. Biradar
Asst. Professor in the department of Pharmacy
Practice of BLDEA's S. S. M. College
of Pharmacy and Research Centre,
Vijaypur-586103, Karnataka, has
been awarded a Doctor of Philosophy
(PhD) in Pharmaceutical Sciences by
Jawaharlal Nehru Technical University
(JNTU) Hyderabad, Telangana state in
the month of June-2016. The PhD
was awarded for the research work entitled “Psychopharmacological
Investigations on the Benefits of Indian Medicinal Plants and
Phytochemicals in the Modulation of Neurodegenerative Disorders”
which was carried out under the guidance of Prof. & Principal Dr.
Hanumathachar Joshi, Sarada Vilas College of Pharmacy, Mysore. He
has been awarded with “Best Oral presentation prize” by AICTE &
ICMR sponsored national seminar on RTDDDDP, at S.E.T's College of
Pharmacy, Dharwad. He credits 18 national and international
Publications to his account in scientific community; he is an Editorial board
member and reviewer for national and international journals. He is a
member of APTI (KA/LM-702) and former Pharmacy inspector of
Karnataka State Pharmacy Council, Karnataka.

Dr. S. M. Biradar thanks research guide, Principals, colleagues, friends
and family members who have helped directly and indirectly.

Dr. Jitendra Gupta,
Assistant Professor, Institute of Pharmaceutical Research,
G. L. A University, Mathura has been awarded the degree of Doctorate
of Philosophy (Ph.D) in Pharmaceutical Sciences on a topic
“Formulation Design, Optimization and Evaluation Drug Delivery System
by Using Microtechnology” under the supervision of Prof. D. S. Rathore, from
National Institute of Medical Sciences, Jaipur. He has published more
than ten research papers in an international journal which is covered in
SCl, PUBMED, Scopus & EMBA SE Elsevier. He has fellowship of
FICPHS and FRSQ. He is awarded “YOUNG SCIENTIST” by the
Society of Pharmaceutical Education & Research (SPHER) in 3rd Annual
conference which was organized by Lovely Professional University,
Jalandhar on March 2014. He has two “BEST PAPER” award. He is
also awarded “BEST STUDENT TS PhD AWARD” by the society of
Research Scholars HUB, Gujarat. He has 19 research papers out of this
18 papers are published in international journals. He has more than ten
years of teaching and research experiences; and presented several papers
in National and International Conferences. He is a life member of APTI.
He is editorial board member of more than seven international/national journals. He is also reviewer in AJPRHC (ESCI Index), JPT (SAGE), Russian Journal of Biopharmaceutics (Scopus), IJDDR (Scopus) & Pharmaceutical Nanotechnology (Bentham Science) etc.

Mrs. Sonali Paresh Mahaparale,
Assistant Professor, Department of Pharmaceutical Chemistry,
Dr. D. Y. Patil Pratishthan's Padmashree Dr. D. Y. Patil
College of Pharmacy, Akurdi, Pune,
Maharashtra, has been awarded the degree of Doctor of Philosophy (Ph.
D.) in Pharmaceutical Sciences under the guidance of Dr. I. D. Gonjari, Professor, Government College of
Pharmacy, Ratnagiri.
She has over 11 years of teaching experience and has published more
than 30 research articles in various national and international journals.
She has presented several papers in national and international
conferences. She acknowledges management of Dr. D. Y. Patil
Pratishthan and Principal Pad. Dr. D. Y. Patil College of Pharmacy, Pune
for providing their constant support during the research work. She
is a life member of APTI.

Mrs. Pallavi Manojkumar Chaudhari
has been awarded with the Degree of
Doctor of Philosophy (Ph.D) in Pharmaceutical Sciences by Jawaharlal
Nehru Technological University, Anantapur,
Andhra Pradesh. She has carried out research work entitled, “A nalytical
and Bioanalytical Method Development for Selected Drugs”, under
the guidance of Dr. I. D. Gonjari, Professor, Government College of
Pharmacy, Ratnagiri.
Principal, P. E. Society’s Modern College of Pharmacy, Nigdi, Pune. Presently, she is working as Assistant Professor in Department of Pharmaceutics at Padmashree Dr. D. Y. Patil College of Pharmacy, A kurdi, Pune. Dr. Pallavi C chaud hari has 8 years of teaching experience. She has published 16 research publications in various National and International journals of repute. She has attended and presented her research work in several national and international seminars and conferences. She is life member of APTI. She deeply acknowledges Prof. Dr. N. S. V yawahare, Principal, Padmashree Dr. D. Y. Patil College of Pharmacy, A kurdi, Pune and management for their moral support.

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Dr. Nitin Sharma, working as an Associate Professor, Department of Pharmaceutical Technology, Meerut Institute of Engineering and Technology, Meerut has been awarded the degree of Doctor of Philosophy (Ph.D) in Pharmacy by Jawaharlal Nehru Technological University, Hyderabad, on February 2016, for his research work entitled “Development of nasal mucoadhesive delivery system for Rizatriptan benzoate” under the guidance of Prof. G T Kulkarni, former dean, department of pharmacy ITM University. Dr. N Nitin Sharma has more than 10 years of teaching experience. He has guided 12 students of M. Pharm (Pharmaceutics) for their dissertation. He has almost 19 scientific publications and 02 applied Indian patents to his credit. He is a life member of A association of Pharmacy Teachers of India. He serves as a reviewer of several reputed scientific journals and author of 01 pharmaceutical book. He is heartly thankful to his Guide, wellwishers and colleagues for their motivation, kind support and cooperation.

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Dr. K. P. Jaiganesh, working as an Associate Professor, Department of Pharmacognosy, Nehru College of Pharmacy, Pampady, Thrivulwamala, Thrisur (D.t.), Kerala, has been awarded Degree of Philosophy (Ph.D) in Pharmacy by PRIST University, Thanjavur, Tamil N adu, on 19th February, 2016, for his research work entitled as “Pharmacognostical, Phytochemical and Biological Investigations on Pterospermum canescens, Roxb., (Sterculiaceae)”. The research work was carried out under the guidance of Prof. Dr. G. A runachalam, M. Pharm., Ph.D., F.I.C., Principal, PGP College of Pharmaceutical Science and Research Institute, N amakkal, Tamil N adu.

Dr. K. P. Jaiganesh, has more than 15 years of experience in teaching and research. He has published more than 20 research papers in both national and international journals of repute. He is a Registered Pharmacist of Tamilnadu State Pharmacy Council and a life member of Association of Pharmaceutical Teachers of India (APTI).

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Dr. Vaishali M. Patil, Associate Professor, Dept. of Pharmaceutical Chemistry, Kharvel Subharti College of Pharmacy, Swami Vivekanand Subharti University, Meerut, participated in Gordon Research Conference on Natural Products and Bioactive Compounds (Frontiers in Sciences) organized at Andover, New Hampshire, United States from July 31 to August 5, 2016. Dr. Vaishali presented a research paper entitled “HCV Inhibitors of NS 5B Polymerase: Potential Leads for Drug Discovery”.

The 65th National Products-GRC was chaired by Prof. Richard E. Taylor, Univ. of N ore Dame and some of the keynote session included talks by Prof. Thomas Hoye, Prof. Hendrik Luesch, Prof. Stephen Frye. Participation and presentation of research work at such international platform enhances the knowledge as well as offers opportunity to interact with researchers, academicians and students from various international research institutes.

Dear Members,

The contributors to APTI Bulletin who require hard copy of the bulletin must send their postal address along with the write up. This will enable us to post hard copy to the contributor. The APTI Bulletin soft copy is mailed to all the APTI members as a Link and uploaded on www.aptiindia.org

Secretary APTI.
She also visited Drug Design and Medicinal Chemistry Laboratory of Dr. Tanaji Talele (Professor, St. John’s University, Queens, USA) and had informative discussion on setting and developing chemistry labs as well as novel practices in the field of drug discovery.

Dr. Vaishali obtained her doctoral degree (Ph.D) from BIT, Mesra and has 9 years teaching and research experience. She has published her research findings in impacted international/national journals as well as contributed to five books by Springer-Verlag Berlin Heidelberg, Basel. Her Lab is working in collaboration with Arizona State University (Tempe, AZ, USA), University of New Jersey Medical School (Newark, USA), National Institute of Technical Teachers’ Training & Research (Bhopal), Lala Lajpat Rai Memorial Medical College, India and University of Lagos (NG).

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Dr. Manikandan Kadirvel, Research Fellow, Wilfson Molecular Imaging Centre, School of Cancer and Enabling Sciences, The University of Manchester, Manchester, UK has been selected for the prestigious JCP Young Researcher of the year 2016 Award. Given annually to an young researcher engaged in the field of Pharmaceutical Sciences by the Journal of Comprehensive Pharmacy (JCP), based on the recommendations of the advisory committee, the award was conferred at the 1st Indo-U K Seminar on “Pharmaceutical Education and Research: Challenges and Opportunities” organized by Gokula Krishna College of Pharmacy (in association with IPA Education Division) at Sullurpet, Nellore, Andhra Pradesh held on 9th July, 2016. JCP acknowledges his contributions by conferring the award to Dr. Manikandan Kadirvel.

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APTI Bulletin and IJPER are not sent to members as hard copies. They are attached individually to the email of registered APTI members. They are also available on the APTI Website. Hard copy of the APTI Bulletin is only sent to Principals of all the colleges.

Secretary APTI
Niels Ryberg Finsen
(December 15, 1860 – September 24, 1904)

He was a Faroese-Danish physician and scientist of Icelandic descent. He was awarded the Nobel Prize in Medicine and Physiology in 1903 “in recognition of his contribution to the treatment of diseases, especially Lupus vulgaris, with concentrated light radiation.”
Introduction: Chronic pain is a serious health issue worldwide. This is a pain that lasts longer than six months. It can be mild or excruciating, episodic or continuous, merely inconvenient or totally incapacitating. The most common sources of pain stem from headaches, joint pain, pain from injury, and backaches. Other kinds of chronic pain include tendonitis, sinus pain, carpal tunnel syndrome, and pain affecting specific parts of the body, such as the shoulders, pelvis, and neck. Generalized muscle or nerve pain can also develop into a chronic condition. Some of the chronic pain disorders are listed in Table 1.

Symptoms:
- Mild to severe pain that does not go away
- Pain that may be described as shooting, burning, aching, or electrical
- Feeling of discomfort, soreness, tightness, or stiffness

Based on data from the 2012 National Health Interview Survey (NHIS), the study estimates that within a previous three-month period, 25 million U.S. adults had daily chronic pain, and 23 million more reported severe pain. The pain becomes more chronic day by day due to several mental, physiological, and biological reasons. As per recent statistics in 2015, nearly

A potential painkiller for humans has been discovered from the spider venom known as H d1a compound which was discovered from Haplopelma doriae, belongs to the family tarantula. This compound blocks the Nav1.7 pathway and reduces the pain. There are total seven promising compounds have been identified and in that H d1a was characterized and revealed its potential effect against pain and scientists are confident that the isolated compound in spider venom could lead to chronic pain treatment.

Abstract

Table:1  Chronic pain disorder

<table>
<thead>
<tr>
<th>Neuropathic pain</th>
<th>Nociceptive pain</th>
<th>Mixed pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripheral neuropathies (H IV)</td>
<td>Rheumatoid Arthritis</td>
<td>Migraine</td>
</tr>
<tr>
<td>Post herpetic neuralgia</td>
<td>Low back pain</td>
<td>Fibromyalgia</td>
</tr>
<tr>
<td>Trigeminal neuralgia</td>
<td>Osteoarthritis</td>
<td>Multiple sclerosis</td>
</tr>
<tr>
<td>Central post stroke pain</td>
<td>Postoperative pain</td>
<td>Skeletal Muscle Pain</td>
</tr>
<tr>
<td>Spinal cord injury</td>
<td>Sickle cell crisis</td>
<td>Myofascial Pain Syndrome</td>
</tr>
<tr>
<td>Neuropathic low back pain</td>
<td>Sports injury</td>
<td>Complex Regional Pain Syndrome</td>
</tr>
<tr>
<td>Chronic inflammatory condition</td>
<td></td>
<td>Phantom limb pain</td>
</tr>
</tbody>
</table>

References

1. Based on data from the 2012 National Health Interview Survey (NHIS), the study estimates that within a previous three-month period, 25 million U.S. adults had daily chronic pain, and 23 million more reported severe pain. The pain becomes more chronic day by day due to several mental, physiological, and biological reasons. As per recent statistics in 2015, nearly...
50 million American adults have significant chronic pain or severe pain, according to a new study prepared by National Institutes of Health's National Center for Complementary and Integrative Health (NCCIH)\(^1\). Not only in America, are the people from around the globe suffering with this chronic pain. In India, as per a report published by the (Times of India 2010) regarding Osteoarthritis, over 40% of the Indian population in the age group of 70 years or above suffer from Osteoarthritis. Nearly 2% of these undergo severe knee pain and disability. Piramal Healthcare Limited in a nationwide campaigned against chronic diseases and predicted that India is to be the chronic disease capital, with 60 million people with arthritis, by 2025\(^2\). Hence special care should take to prevent these chronic pains. Current analgesic drugs are having limited efficacy and dose-limiting side effects and also humans with loss-of-function mutations in the voltage-gated sodium channel Na\(^+\)V 1.7 (hNa\(^+\)V 1.7) are indifferent to pain, making Na\(^+\)V 1.7 a promising target for analgesic development. Some compounds that are isolated from spider vemon are potential as a source of Na\(^+\)V 1.7 inhibitors because spider venoms are replete with Na\(^+\)V channel modulators. Researchers of University of Queensland's Institute for Molecular bioscience found these compounds in spider venom and among that the Hd1a compound has got characterized which could effectively quell chronic pain\(^3\).

**M**echanism: The Na\(^+\)V1.7 channel is found in the neurons in the pain pathway. This channel is essential for pain sensation. The loss of Na 1.7 channel activity via mutation leads to pain insensitivity. Thus, blocking this channel is most essential and Hd1a compound is acts on that by blocked the pathway, controls the pain massages in the nervous system. This mechanism was identified using fluorescent based assay method where venom from 206 different types of spiders were screened and revealed 40% had similar compound i.e. Hd1a that blocked the Na\(^+\)V1.7 channels and also has a cystine knot motif that makes the chemical, thermal and biological stability of the compound (Fig. 3).

**Conclusion:** The study reveals that spider venom is a promising natural source for molecular therapeutics which relieves the chronic pain by blocked N a\(^+\)V1.7 pathways. Further investigation on clinical validation of Hd1a and other unidentified compounds with analgesic potential need to carry out for discovery of new lead molecule for chronic pain.

**References:**


