Identifying a research topic: The problem is the problem...

There was a discussion on the Indpharm e-group in the recent past regarding the selection of a research topic for a thesis. The so-called "projects", "theses", "dissertations" given to students of various courses such as B.Pharm, M.Pharm, and M.D. are more often than not done with the intention of introducing the learner to research methodology and making him/her familiar with scientific writing. These research projects are therefore undertaken to fulfill curricular requirements rather than being done for the love of research or a need to add new evidence to the subject. This is why we are churning out thousands of third rate me-too projects year after year.

The need to teach research methodology in these courses is beyond argument. What should be questioned is whether asking the student to do a project which is largely substandard is the correct way of initiating a person into research?[11]

Interactions with postgraduates and teachers in different colleges reveal that students are having problems identifying research areas to conduct research and are not getting proper guidance in how to go about the whole thing. Colleges lack infrastructure necessary to conduct research which ranges from lack of basic facilities like precision balances, animal house, centrifuges, library and computers with internet connectivity to committed, dedicated, experienced faculty. With this kind of a set-up facing the students, is it any wonder they are churning out me-too research projects which are not of "publishable" quality?

On the flip side, there is an increased awareness of this whole sorry scenario and an enthusiasm among both faculty and students to improve this state of affairs. More workshops are being organized by various journals, colleges, organizations on research methodology, scientific writing and so on. Many senior and not so senior scientists are ready to share their time and expertise with junior faculty and students and train them on the elements of research methodology. The Indian Journal of Pharmacology and the local branches of the Indian Pharmacological Society have been conducting such workshops and providing hands-on training at various cities. However, the number of students being trained at these workshops is very few, since in order to provide hands-on training, facilitator-learner ratio has to be low. Until a critical mass of trained faculty/students is created which is sufficient to be self-propagating, this lack of trained minds will be felt.

There is no doubt that despite the advances in computerization and the availability of software for some of the more complex calculations in pharmacokinetics and statistics, the science itself has become more complex. One only has to take back issues of any reputed journal to see examples of improperly applied statistics, ethical violations, poor study design and so forth. What was acceptable three or four decades ago will be simply unacceptable by today's standards. The burden of substantiating research findings is more stringent and is bound to become more so with the passing of time. Hence even though there is a tongue in cheek observation that ultimately all papers, good, bad and terrible will eventually get published somewhere, one should remember that even this is becoming increasingly difficult. Therefore, unless the idea is novel and the information gathered from such a study will add to the knowledge base these projects will be extremely difficult to publish in a journal of repute. So, the responsibility of nurturing honest, dedicated, enthusiastic researchers who are not afraid to ask the right questions lies squarely with the faculty of the various colleges, since it is at this formative stage students are most vulnerable and will forge lifelong attitudes towards research.

Given the constant refrain that it is the resource crunch which is largely responsible for not attempting to pursue the topics of one's choice, one must remember that resource crunches are not new to science or scientists. They exist even in the best of labs. It is the degree and dimensions which differ. I am sure, many of us trained in India will be able to recall having to personally feed, clean the cages and transport experimental animals into the laboratories, conduct the experiments and even clean-up afterwards. I am equally certain that not one of us would have felt that it was a burden or that it was not our job to do what is perceived as the menial tasks accompanying the experiments. Since then, there has been a distinct change in psyche and nowadays students believe that as scientists they should not have to do such tasks. Students seek to do "white collared research" wherein one has to work with sophisticated sensors, computerized apparatus and automated molecular biology equipment amidst sterile, gleaming air-conditioned laboratories and somehow feel that using "not so high tech" instruments is infra-dig. This is why so many are ready to jump the biotechnology bandwagon and abandon the critical down to earth basic pharmacodynamic studies and clinical trials. There is also a feeling that it is more trendy to work in this kind of environment and would improve their chances of employment. So the quibbling of lack of resources would go on. This should not be misconstrued that we must always "try and manage" (a phrase I have always hated) with whatever equipment is available and never attempt to obtain the latest equipment in the field. It is the duty of each faculty member to build up resources of his/her own department for the ultimate benefit of the students.

Another problem is the inherent fear of a negative result and lack of support given to students who want to investigate new lines of thought. There is a near total ban imposed on them starting from their guides and trickling down to the institutional research committees. I find it rather amusing that many of the top brass in these committees would rather encourage me-too research than even frank plagiarism than support a new idea. They find it comforting to know that a study will eventually get published somewhere, one should remember that even this is becoming increasingly difficult. Therefore, unless the idea is novel and the information gathered from such a study will add to the knowledge base these projects will be extremely difficult to publish in a journal of repute. So, the responsibility of nurturing honest, dedicated, enthusiastic researchers who are not afraid to ask the right questions lies squarely with the faculty of the various colleges, since it is at this formative stage students are most vulnerable and will forge lifelong attitudes towards research.

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looking at the “Indian perspective” or the effect on some other species of animal rather than tackle something refreshingly new. Research guides should have the magnanimity and the experience to promote new lines of thinking, urge their students to follow it and also be able to buffer a fall if it happens.

What is the way out for someone who needs to have some experiments done for which there are no amenities in the parent department? There are many national centralized facilities in India which have been created to address this problem. The Government has set up state-of-the-art laboratories in various institutes to help those who want to use these equipment but do not have the resources. For example there is a Magnetic Resonance Imaging unit for animals in All India Institute of Medical Sciences, New Delhi which was set up as a nodal unit to help those wanting to do these studies in animals. Similarly the Brain Research Institute in Delhi has excellent facilities for neurosciences and the Centre for Cellular and Molecular Biology has all the equipment for advanced molecular biology and students can conduct part of their research in those labs. Many scientists also help personally and would accept to run a few additional assays or tests and permit use of lab equipment if there is a personal request. However, these lines of help are not sought, not because they are not available but because it is easier to say that they would be refused permission (so why waste time and effort?) rather than try. These big institutions should also realize the problems of students coming from “infrastructurally challenged” institutions and make it easier for them to approach laboratory heads for help and support.

The use of bulletin boards and e-forums to get information is fast catching on. I have been visiting various websites and have found many students (I am merely guessing they are students) posting questions which could have been avoided if they only took a quick look at standard textbooks or did a simple keyword search on the net. Since I have found some students posting such fundamental questions on Indpharm too, I get a feeling that students find it easier to ask someone for information rather than to seek it by themselves. The problem with this is that the answers supplied on these bulletin boards are not authenticated unless accompanied by references. I am certain that most of those asking the questions would be happy to use the information without bothering to read the references for themselves. This is a very unscientific trend which is being set and would have far reaching consequences. Apart from the fact that the students do not learn how to do a literature search (and are perhaps too lazy to do one) they may be too inexperienced to know when someone is giving wrong information. It is somewhat disconcerting to think that perhaps these students have not been instructed the correct method of doing a literature search.

One may not be lucky enough to get a good mentor but one could certainly become one with some effort. Unless students are persuaded, coaxed and even admonished at times to take on challenging research projects the stars in their eyes would quickly be wiped off. I hope as mentors, we would not be found guilty of doing so since it is our duty to make their journey into the scientific world long, glorious and full of adventure.

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