The State of Intellectual Property Education Worldwide

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Abstract

The importance of intellectual property (IP) in today's world cannot be overstated and, indeed, it is receiving a great deal of attention worldwide. To advance the cause of the rights and wrongs of the laws that promote and protect intellectual property at the national and international levels, education in intellectual property is required and must be advocated. We must make individuals, industries, and governments aware of the concept of intellectual property, and only then can they take positions on the issue in order to effect change. This paper explains the concept of intellectual property rights and provides a detailed overview of the state of IP education worldwide. The discussion divides the globe on the basis of economic distinctions between nations and studies the question in the context of their developmental levels: developed, developing, or underdeveloped.

The State of Intellectual Property Education Worldwide

Intellectual property (IP) consists of any ideas, concepts, insignias, and symbols that are unique and original to the owner. IP has various broad categories: copyright, trademarks, patents, designs, and other types of information. The concept is best thought of as a bundle of rights protected by law. Trade secrets, expertise, and know-how, are instances of confidential company information that are also covered by IP laws. These ideas and concepts are assets to an organization or country and can be extremely valuable. It has been estimated that IP, as intangible assets, constitutes around 75 percent of the assets of publicly-listed U.S. businesses (*Economist* 2005). Technology-licensing revenues are estimated to amount to $45 billion in the U.S. and over $100 billion (and growing) worldwide. This demonstrates the importance of protecting IP.

While IP rights are intangible, the law will enforce them only if the creative work is fixed in tangible form. This means the work has to be fixed in a medium of expression, such as on paper or an audio CD. In the past, a tendency to overlook IP rights existed, but it is emerging as one of the most important areas in the commercial and academic world today. As mentioned, businesses have an ever-growing portfolio of IP, and inventors are working to create more, as investors rush to put their money into the next round of R & D efforts. Science and technology are constantly changing our world, and their applications to our everyday lives make a significant contribution to our comfort.

Isn't it warranted that we seek to protect the creations of the scientists, technologists, and artists who enrich our lives? The idea behind intellectual property rights is to provide creators with the right to control their works. Individuals or groups inventing the work have put their genius, hard work, and resources into its creation. Inventors should be rewarded for their efforts and reap the benefits of their research. Eliminating the incentive of reward discourages creativity. This is the capitalist ideology and, in practice, creativity and reward are inextricably

linked.

The opposite argument exists, however—that protecting IP leads to a virtual monopoly over the work for the owner, which is not in the interests of the public. Yet, our government and its founders have seen to it the essential uses of critical work are always made available to the public. IP laws are structured in a way that allows a case-by-case subjective decision for any possible infringement, because settling disputes requires litigation. That said, it is essential to further IP education in the country and around the world to awaken people to the concept and importance of IP. Most people are oblivious to the need to protect IP. In developing countries, reverse engineers are busy creating exact replicas of patented inventions, and students or faculties of universities are using copyrighted material without realizing the consequences.

It all comes down to the state of intellectual property education throughout the world. People need to be educated about IP and the laws in their country and internationally so they can appreciate the need for such laws and can adhere to them. Intellectual property can easily be transferred across borders via the Internet and satellite, and this creates jurisdictional complications. Laws that cross borders and operate internationally need to be implemented by every country in order to protect the rights of owners. Education about IP implies learning that specifically seeks to create an awareness of IP, its associated rights and duties, and the various IP laws. Supporters of IP laws are calling for the establishment of this type of education at every level in the system, not only in higher education.

Typically, IP education is available only in law school (courses are limited there as well) and for librarians, teachers, and others who deal directly with potential IP litigation in the course of their jobs. Even basic education for the lay person about the field of IP is not always available.

The Need for IP Education

Increasingly, the arena of IP rights is gaining prominence in international commercial relations. Its importance can be discerned in the creation of the World Intellectual Property Organization (WIPO) by the UN in 1967, which retains administrative control over 23 different IP treaties. The global economy is moving towards greater dependence on intellectual property and is becoming knowledge driven. The focus is shifting away from products and services linked to land and labor and shifting toward those linked to intellectual capital.

Another point in its favor is that trade in "knowledge-intensive" products has increased a great deal, causing a sharp increase in the number of IP-related treaties and the extent of their reaches. Protection of IP is now firmly on the agenda for any international trade treaty. The Trade Related Aspects of Intellectual Property (TRIPS) Agreement under the administration of the World Trade Organization compels member countries of the WTO to establish and enforce appropriate IP-protection systems nationally. Barring the emerging importance of IP at the international level, other domestic reasons exist for the introduction of IP education at higher education levels. The scope of individuals and organizations impacted by the protection of IP is also widening, almost down to the grassroots level in some countries. Among the spectrum are small and midsize enterprises (SMEs), R & D institutes, and ethnic communities. SMEs are responsible for the bulk of economic activity and employment in a number of countries, generating and utilizing large amounts of intellectual capital. Baumol (2005) found "that most of the revolutionary new ideas of the past two centuries have been—and are likely to continue to be—provided more heavily by independent innovators who essentially operate small business enterprises." The existence of these SMEs can rely on the proper registration, protection, and management of intellectual property by taking the most commercial advantage of it. IP is an asset in itself, due to its commercial value and potential to bring in continuous royalties. R & D institutes are well aware of this important aspect, and it is the lifeblood of their businesses. All such institutes, big and small, are dependent on the adequate protection and administration of the IP they produce.

Ethnic knowledge, also known as traditional knowledge, is the specific know-how handed down within indigenous

communities for generations. It is part of a country's national heritage and needs to be protected, because it can have intrinsic monetary value. For instance, the cheese-making secrets of France have commercial value and are strictly protected by the government. Countries need to frame or adapt laws that protect the ethnic intellectual property of their communities and give the communities the returns from their IP, in addition to helping ensure that international IP laws follow suit.

Further, due to rapid and continuous advances in science and technology, the scope of intellectual property has increased sharply. The development of information technology, communications technology, e-commerce, biotechnology, and a number of other emerging areas has led to the increasing centrality of IP in the agenda of businesses and nations. Additionally, the priority of development for the more underdeveloped areas of the world is also creating new demands and questions to answer.

IP Teaching Methods

Numerous methods to teaching IP exist, and these pedagogies need to be chosen according to the objectives and target groups. The traditional method of teaching IP was in-person interaction in the classroom. This method included a specific number of lectures, tutorials, and follow-up sessions with an instructor, a specialist in his or her field, and learning was based on interaction. The student and instructor were present at a fixed time and place. The biggest challenge this posed was the availability of trained IP staff. Even in some of the world's most advanced countries, a severe shortage of staff exists and, even in the presence of IP staff, a lack of funds may also. As for the less-developed countries, the situation is even more dismal for the traditional classroom method of teaching.

The concept of distance learning is changing old methods and inventing new ones. Initially, distance learning meant course packs were sent out via regular mail and students read them and interacted via mail or e-mail. At the end of the semester, students went to a testing center to take an examination. Recent changes in distance learning, however, have introduced more technologically advanced methods, such as video and audio conferencing, recorded lectures transmitted via satellite, e-mail, live chat, and Internet databases. The traditional mode of distance learning was supplemented by these multimedia learning devices and methods to allow for a more well-rounded and interactive relationship closer to the traditional classroom method and at much less cost.

Re-usability of the recorded and digital material allows for instruction to be delivered to expanded audiences and, after payment of royalties and obtaining permission from owners, the cost is still much less than any traditional method. Further, the problem of locating trained IP staff is removed, because one instructor's course can be used for multiple school locations. Radio, TV, telephone, and the Internet provide means for delivery of material and expand the reach for universities and colleges. Time and location constraints are, to a large extent, also lifted. While the student must reach a specific location where the satellite or taped lecture will be delivered, this location can now be much closer to home. The WIPO Worldwide Academy has developed a distance learning program open to anyone that trains larger numbers of students at a lower cost in a narrow time period; it reportedly trained 10,000 individuals in seven different languages in 2003 alone.

IP Education in the Developed World

In the early 1980s, the education of IP in law schools in the UK and Europe began in earnest, due to growing demand as a result of computer software litigation. In the UK, the publication of Professor B. Cornish's textbook in 1981on various IP rights created interest in the field. Gradually, IP education spread beyond law schools and into other disciplines, because students in areas such as business and economics began to realize the commercial relevance of IP. Other types of IP-related career paths opened up, and the demand for IP education picked up further.

Further changes that contributed to the increased study of IP as a discipline at this time were the modifications

made in the area of accounting in the U.S. and Europe. The new method allows for the inclusion on the balance sheet of IP assets at all times, not only when the IP asset is traded. Additionally, the rise of "enterprise education" in the developed world has led to interest in IP education. Enterprise education implies learning with the objective of pursuing an entrepreneurial career later. The EU's objective to become the leader in technological achievements is another push factor in the demand for IP education here. In the UK, half of all law schools offer an intellectual property law elective as part of an undergraduate program.

Science, engineering, business, and technology are the areas most associated with learning about IP, because they generate the most intellectual capital. The European Commission has stated its intent to provide a basic level of IP training to all students of the above disciplines, and it is in the process of establishing programs and releasing funds to universities and faculties for this purpose. In universities in the U.S. and Europe, technology transfer offices grow in number and lead to increased awareness on campuses. These offices serve to strengthen the protection extended to IP at the university level.

Governments, the private sector, universities, and professional bodies have begun to show an interest in learning about intellectual property and spreading knowledge. WIPO, the U.S. Patent Office, and the European Patent Office are involved in creating programs that will allow for easier access to information and education about IP, including how to deal with interdisciplinary IP. The amount of thought going into preparing curriculum to deal with IP education is increasing, and the realization the study is necessarily interdisciplinary is emerging. For instance, the UK requires patent agents to have a technology, engineering, or science major in their first degree, prior to the commencement of IP studies. University engineering faculty and U.S. patent attorneys Kaplan and Kaplan (2003) include IP law in their engineering classes, saying, "IP knowledge is important for engineers: engineers should try to understand IP basics to protect their creations. Also, IP searches can indicate the growth of different engineering fields. Furthermore, the proper use of IP promotes the progress of a field."

In the developed world, the music and film business is heavily under attack from piracy and counterfeiting. Governments recognize that young people exposed to these types of counterfeit products may not realize the extent of the damage done to the business world or that the activity is necessarily criminal. Therefore, governments in these countries are trying to create awareness campaigns directed at even younger age groups in order to have a more lasting effect. The focus on primary and secondary level students is increasing in the UK and other developed countries. The UK Patent Office organized the 'Think Kit' in March 2003, which was adopted by 51 percent of UK schools.

The Japan Patent Office has developed a project to ensure that intellectual property education is seen as a priority in schools. The project will provide education on IP to teachers, fabricate interesting textbooks, and teach students about IP rights. Japan, the world's leader in the number of patents filed (359,382 patents filed by Japanese residents in 2005 according to the WIPO Patent Report 2006) is aiming to use libraries and museums to spread the message as well. The government has enacted legislation to compel universities to provide IP education. The Osaka Institute was charged with researching the requirement for IP learning at the undergraduate stage, and it came up with the interesting recommendation for a non-law IP department (Soetendorp, 2006). The Australian government is also trying to catch them young with a program similar to that in the UK: IP Australia's InnovatED. The idea is that IP will no longer be a new concept for an undergraduate; it will be an elected field of study about which basic knowledge already exists in the student's mind.

IP Education in the Developing World

In the developing world, the question of IP and its education is a murky one. While countries are making an effort to curb the exploitation of IP and to educate their citizens, the concept is catching on only slowly. Many developing nations face a funding crisis when it comes to creating programs on IP awareness. Additionally, their national agendas are more focused on core and basic issues. Finally, in some countries, foreign exchange earned from the illicit trade of intellectual property in the form of DVDs, CDs, and other multimedia can be a formidable amount,

and the underground industry is too powerful for the government to control.

While some countries have promoted programs to increase IP education, it comes as a strange paradox, with their neglect of the enforcement of IP laws. Countries such as China and India see large numbers of counterfeit multimedia in the form of educational material and entertainment media. China, in particular, has been under attack for its large underground industry creating huge amounts of counterfeit and pirated media for use domestically and for export. The government has tried to implement educational activities among the public, but there is a long way to go.

Further, these countries produce a great deal of intellectual property of their own in the form of computer software codes, generating more interest in these countries lately. The focus of learning in developing countries continues to be the battle for literacy and access to education for the masses. Affordably priced educational material that can be widely distributed is sought by governments in the underdeveloped regions of Asia, Africa, and South America. For most developing countries, therefore, the emphasis is on attaining learning material for primary and secondary education, as opposed to a national agenda concerning IP law education at the higher education level.

The second issue facing the developing world is the lack of individuals adequately trained in IP law and education. Because intellectual property education is not widely available in law schools and other institutions of higher education and does not translate to numerous career choices, the number of graduates in this area is less than the number required to fulfill the need for IP teachers. Taken with the first point, it becomes a vicious cycle: a limited number of IP teachers and limited learning resources mean a limited number of students preparing to become IP teachers.

Finally, the producers of intellectual capital have been concentrated in the developed world due to a greater supply of funding and research facilities. These producers are imposing restrictions on their IP, which limits the supply of quality, up-to-date teaching materials for the developing world. The cost of access to the material can be prohibitive to those nations' educational budgets.

Most education is imparted through traditional methods, such as the written or spoken word, rather than digital mediums. Access to the Internet and computers is also comparatively lower in developing nations, and for this reason IP education in these areas needs to focus on non-electronic, non-digital media, unlike in the developed world. Programs advocated by developed countries cannot be applied blindly to developing nations, because their structures are dissimilar.

Several of the more prominent developing nations in the international trade arena are attempting to (1) change the way the domestic population views IP and (2) generate greater awareness. These countries, such as China and India, as mentioned earlier, are working against a vast and wealthy black market for such products. Despite this, a marked increase has occurred in patent filings in these countries in the last few years. Among the top 15 patent offices worldwide (WIPO Patent Report 2006), China, India, Brazil, and Russia have shown an increase in the number of patents filed by residents from the period 1995 to 2004. Of all 15 top filing nations (by residents), China has shown the most dramatic rise in the same period at 557 percent, followed by India at 365 percent. The developing nation of Ukraine has shown a reduction in the number of patents filed by residents in this time period, declining by 15 percent.

The eventual effect of an increase in patent filings in any country is the ultimate trickle down to an increased awareness of IP issues, due to vested financial interests. A wealth of IP could potentially come from these countries, because of their significant population size and levels of education.

IP Education and Governments

The role of government in promoting and protecting IP rights is clearly central to the debate. Legislators create laws meant to encourage creativity and diversity without stifling the right to information. Communicating this delicate balance to the public is sometimes challenging. Government needs to make a conscious effort to work through the education system in order to impart an understanding of, for example, the need for IP and the rights of owners. At the same time, a government must not over-protect its own citizens; it must ensure that international regulations and standards are taken into account and build upon that platform.

Government needs to recognize it has a lot to gain from the proper protection and management of IP within the country and outside. In an environment where IP law is honored, the level of innovation will increase, as will its benefits. The corporate sector will receive impetus, industry will become more efficient, and academics will reach the cutting edge. Overall, the global economy will receive a boost with increased awareness and enforcement. The responsibility for the management of IP law ultimately resides with government.

Each country has its unique needs and milieu, however, according to which the administration must find solutions. It is imperative the government recognize the importance of the field, give it appropriate weight, plan policies around it, and disburse funds to achieve IP education goals. There is now plenty of support, advice, and aid available for this purpose from international agencies such as WIPO and its regional partners.

IP Education and the Private Sector

Even more important is the role of the private sector in developing the market for IP education. This sector stands to benefit a great deal from the products of IP. The developed countries, in particular, are creating more knowledge-intensive products and services. In 2005, the well-known magazine *The Economist* claimed that three-quarters of the value of America's publicly traded companies comes from intangible assets. Licenses and patents form a large chunk of the assets of a growing number of technology companies. These companies are becoming some of the heaviest hitters in the commercial world and are dependent in large part on IP and its protection. Additionally, the emerging stars in the technology arena, for instance, places like India and China, are generating their own levels of innovation and trying to move up the value chain. Infringement lawsuits, as well as the cost of litigation and the amount of damages awarded to plaintiffs, are increasing.

The private sector has the largest vested interest to ensure that IP rights are not infringed and to take steps to form an organized front against offenders. Issues arise when the informal economy becomes heavily dependent on revenue from illicit copying. At times, this can even lead to collusion between the two sectors—formal and informal—and result in losses for the rightful parties. For instance, Lawrence Liang (2004) narrates an incident surrounding collusion in the Indian film industry: "Even major players like HMV in the past dealt with the pirates. For instance, when HMV found that they could not meet the demand for one of their biggest hits, Maine Pyaar Kiya, they are reported to have entered into an agreement with the pirates, whereby the pirates would raise their price from Rs. 11 to Rs. 13 and pay HMV half a rupee for every unit that they sold, on the condition that HMV did not sue them or raid their businesses. Other producers are also known to have colluded with pirates in production and marketing so that they can minimize their cost, the taxes payable and royalties by hiding the extent of their sales."

With these opposing interests, it can sometimes be difficult for the private sector to unite in the interests of furthering IP education. A majority of businesses stand to lose money due to the infringement of their copyright, and these companies need to understand that creativity must be rewarded in order for it to be sustained. The private sector needs to work with the government and educational institutions in order to affect a change. Once intellectual property assets have balance-sheet value, they are a powerful tool for any company. IP rights have the potential to "command premium selling prices, dominate market share, capture customer loyalty and represent formidable barriers to customers."(Wise 2003) Within organizations and through trade associations, companies

need to foster an environment actively engaged in IP learning and teaching activities.

Specific Country/Regional Examples

Belarus – a Developing Nation

Belarus, with a population of approximately ten million, is a developing country in Eastern Europe. In 2005, the annual growth in GDP was a high 9.2 percent, according to the World Bank. The government has taken an active role in promoting the growth of the economy, with targeted efforts at reducing inflation, balancing the high dependence on trade with Russia, and implementing a state-enforced wage increase. The inflation rate stood at around ten percent in 2005. The main industries continue to be heavy machinery, mining, chemical fibers, textiles, motorcycles, and television sets.

Based on statistics indicating that developed countries are using IP innovatively and effectively to achieve most of the growth in their GDP, Belarus has turned its attention toward this sector in hopes of boosting GDP growth by identifying areas to develop. Belarus has used the National Center of Intellectual Property (NCIP) to create and support programs that promote IP education in the country. This agency, based in the capital city, Minsk, has become the spearhead of a change engulfing the entire region. Studies conducted by the Belarus Ministry of Education over the past five years have shown a regular increase in the amount of research carried out by the state-funded institutions of higher education.

The universities of this small nation produce an extremely large number of innovations—over 700 a year—and these cover every major sector in the economy (*WIPO Magazine* 2006). The robustness of IP development is evident: one of every four patent innovations is filed by an educational institution. Invigorating though this is for a nation, it is tempered by a sobering fact. The corporate sector does not seem to be showing the growth that corresponds with such increased innovativeness. The creative buoyancy has not translated into financial gains and improved productivity, as it logically should.

Two major reasons are cited: first, lack of protection from a legal perspective, due to incomplete knowledge and enforcement of IP laws in the country. Second, faulty management of IP exists in the corporate world of Belarus. An analysis showed that a combination of these factors led to mismanagement of IP issues, resulting in the squandering of the innovativeness of Belarus' inventors and entrepreneurs. While focus on IP learning in the organized education setting is clearly required as well, the government has decided to actively target the professional environment by providing human resource training in IP to the corporate world.

In order to achieve this objective, the NCIP was directed to create a dedicated agency called the Training Center of Intellectual Property, controlled and managed by the government of Belarus and the NCIP. WIPO has supported the efforts of the NCIP in this direction and, in November of 2004, a Protocol of Cooperation was signed jointly by NCIP Director General Leonid Voronetsky and WIPO Deputy Director General Philippe Petit to seal the collaboration. The Protocol elaborates on the specific technical assistance that WIPO will offer, including computer software and hardware, IP training material and syllabi, and distance learning programs. The initiative has seen a great deal of success. In 2005 alone, the Training Center played host to 2000 people in its training camps, workshops, programs, and lectures.

A huge demand exists for more programs and offerings for a greater number of applicants. The Training Center is becoming a regional hub, with people from neighboring countries, such as Latvia, Russia, Poland, and Ukraine, showing interest in attending seminars and courses. The sharp increase in demand is evident in the creation of a new consultation service by the Training Center that responds to queries about more specialized courses and provides advice to interested individuals. This service is soon to be expanded into a consultation network throughout the country. Signs of expansion are extant in the addition of new premises for the Training Center on

the Scientific and Technical Library of Belarus.

In addition to these efforts targeted at the corporate sector, groundwork has been laid for the future with the initiation of courses and programs at the high school and college levels in the academic year 2006-07. The courses focus on the issues surrounding IP management in the corporate world and are being called collectively "Fundamentals of IP Management." The course curriculum covers the entire spectrum of IP rights and laws in Belarus, for instance, obtaining patents for inventions, IP rights in Belarus and internationally, IP laws in the country and internationally, IP valuation, and the licensing procedure. The approach includes theoretical, legal, and practical aspects of managing IP effectively in the professional world.

Due to the interdisciplinary nature of IP and the potential friction caused by this aspect, as well as the collaborative nature of invention, the Belarus government has taken steps to ensure that the efforts in providing IP education are coordinated. In 2005, legislators set up a specific Interagency Advisory Board that looks into the issues that may arise and troubleshoots them. The purpose of the Board is to refine and continuously update curricula, material, and methodology for the Fundamentals of IP Management courses and provide advice and coordination to the efforts of parties associated with IP management and training in the country.

In May 2006, the Eurasian Patent Organization and WIPO held an international conference in Minsk, attended by participants from over 20 countries, to discuss IP education and training efforts. At the forefront of this conference were the Training Center and the courses designed by NCIP and WIPO. The objective of the conference was to devise strategies on human resource development as a means to increase innovation and financial and logistical management of its products, as well as to discuss the present state of IP education in the region. To this end, deliberations occurred regarding the set-up of a new IP training hub for the region via cooperative efforts by WIPO, NCIP, and the Russian State Educational Institute of Intellectual Property.

New norms and targets to aspire to within IP education were established in order to achieve greater efficiency, higher quality, and deeper reach. Participants discussed the need for generating awareness and popularizing the idea of IP among a younger audience, as well as strategies for accomplishing this task. The demand and need for specialized and targeted programs are clearly present, and the governments of Belarus and surrounding countries are gaining an awareness of the issue. The Interagency Board, the NCIP, and WIPO are working towards offering greater value in the area of IP education in Belarus and are receiving much of the support they need. It is a sign that developing nations are looking toward IP protection, management, and education as the way forward to become more competitive in a global market.

Southern Africa – an Underdeveloped Region

As is well known, the problems in underdeveloped nations, indeed in Southern Africa, are not simplistic and cannot be easily answered. The solution will be sophisticated and contingent on a number of unpredictable factors that may be out of the control of the governments of these nations. The concept of IP itself—and of its education and training—is one largely unheard of in this region. If it exists at all, it is from a very different perspective that IP is viewed; it is seen as a stumbling block in the effort to provide greater access to educational materials in very poor countries.

For development, basic literacy is required first, and to achieve this goal governments in underdeveloped countries attempt to provide free and widespread access to education, from school premises to textbooks. However, these governments do not usually have the funding to buy sufficient quantities of textbooks that are copyright protected and therefore more expensive. This often leads to abuse of IP-protected materials—ignored by authorities in the interests of promoting education at various levels.

While the producers of copyrighted material in the West are keen to pursue more aggressively the enforcement

of copyright protection worldwide, users in the underdeveloped world are unable and unwilling to participate. Since these countries are not major producers of IP, they have less reason to ensure the enforcement of laws. Southern African Customs Union, known as SACU and comprising Botswana, Lesotho, Namibia, Swaziland, and South Africa, is a member of the WTO and therefore required to adhere to WIPO guidelines. While Southern African countries struggle to broaden IP laws in order to allow for lawful access to educational material by its masses, some parties tend to view this as an attempt to circumvent the penalties for plagiarism, widespread copying, and organized infringement.

In some countries such as Uganda, the politically influential, though relatively small, middle class has access to 'ripped' or pirated CDs and pirated entertainment media. A change in IP laws, say detractors, could bring this illicit activity into the mainstream and make it permissible. Clearly, no educational motive exists here, and the IP laws are not meant to give impetus to this industry. This creates a conflict of interest and makes it difficult for the Ugandan government to separate the legitimate and fair use of IP-protected materials for education from illegal uses.

On one hand, there are constraints in the government's resources, and textbooks are a major cost of education in this region, due to lack of access to digital media. On the other hand, a comparative study of the price of textbooks shows that a lack of competition in the publishing industry results in higher, monopolistic prices. Aid agencies and NGOs face a challenge in terms of accessibility and funding as well. This is where the question of fairness arises and, in many cases, a great deal of infringement occurs in the informal sector.

An instance of copying in the informal sector of education is an enthusiastic NGO worker (thinking of the big picture), obtaining permissions, paying royalties, legitimately downloading a single copy of a book from the Internet, but printing up large numbers of the book to generate enough copies to distribute to schools. Photocopying is a very large business in this part of the world, because of the greater dependence on the printed word than on digital media. Many small photocopying businesses exist by copying textbooks for distribution by schools, colleges, or directly by students. An educator in Southern Africa may feel justified in allowing students access to a book they can copy because they could not possibly afford to buy it.

A study (Rens, Prabhala and Kawooya 2006) of Uganda's Makerere University in Sub-Saharan Africa, a school with over 30,000 students and rising—despite scarce funding sources—showed stunning results. The number of pages copied by 5,700 faculty members and over 34,000 students per day in the university is 43,400 on 76 photocopiers. The question naturally arises whether the operators of these machines and their clients are aware of their potential culpability in terms of copyright infringement. A recent study (Okiy 2005) in Nigeria on the subject of copyright and photocopying broadly attributed the potential infringement of copyright by petty photocopier businesses to lack of knowledge on copyright law. The same study also pointed out that half of all the student respondents were aware of the laws, and 50 percent of them claimed they copied the work for economic reasons. Interestingly, 51.5 percent of the materials copied came from libraries. Whether or not any infringement occurred, however, was not investigated by the study, which did not take into account the amount of copying permissible for education under the terms of fair use.

IP education as a concept therefore is seen in a negative manner by governments, educational institutions, libraries, and students in the Southern African region. Librarians face a daily paradox: protected IP (e.g., books, CDs) and the cost of obtaining it causes a strain on libraries' financial resources and leaves patrons' demand for these items unfulfilled. Yet, librarians are required to study and impart IP education and adhere to its tenets. Indeed, the question of IP rights in Africa has little to do with financial gain. A study conducted by the Print Industries Cluster Council (PICC) in South Africa (Grey and Seeber 2004) and undertaken on behalf of the Ministry of Arts and Culture states, "Copyright infringement in South Africa is not a matter—at least not yet—of the mass piracy of trade books, like the pirated editions of Harry Potter titles that have appeared internationally, but of systematic copying of various kinds in the educational sector, public sector and businesses. While piracy of this kind of is causing concern to international rights holders like the IIPA [International Intellectual Property Alliance], popular

books have not been the targets of similar piracy."

United States of America – a Developed Country

The area of intellectual property education is robust in the U.S. and, although it may have some ways to go in creating widespread knowledge on the subject, interest exists within the government, the private sector (in the form of "special interest groups"), and other involved parties. According to a recent study (Hill and Latimer 2003), "The IP field in the United States can be characterized as having a great deal of dynamism. Dynamism can be thought of as the sum of the interaction among professionals in the IP field, the amount of individual activity of professionals in the IP field, and the many different roles played by individual professionals in the IP field at one time during, or over the entire span of, their careers…many professionals play multiple roles in the system, for example, acting as both judges and as law professors at the same time. This dynamism provides a continuity and consistency to the U.S. IP system, and promotes cooperation among IP professions, all of which benefits the IP system in general."

The U.S. government relies on the private sector quite heavily in its approach to IP rights and education. "Dynamism" results from both organized and informal interaction among IP professionals, such as (1) law professors at law schools, (2) attorneys teaching at graduate or law schools as "adjunct" professors, (3) attorneys working in the corporate sector, and (4) the government, including senators, presidents, legislators, and judges. Additionally, there is the backing of many professional and educational associations formed as a result of the time devoted by their members after normal working hours. Instances of these are the American Intellectual Property Law Association (AIPLA), the American Bar Association (ABA), the National Association of Patent Practitioners (NAPP), the International Association for the Protection of Intellectual Property (IAPIP), the American Association for the Advancement of Science (AAAS), the Institute of Electrical and Electronics Engineers (IEEE), and the American Association of University Professors (AAUP), as well as prominent law schools with in-house IP education associations, such as Stanford Law School's Fair Use Project and a number of local bar associations with IP chapters.

While attorneys in the U.S. represent less than three percent of the total population, in the last Congress, 142 of its 535 members were trained legal attorneys; 25 of the 43 U.S. presidents have been formally trained attorneys. This would seem favorable for the cause of IP education in the country, but the fact remains that, despite their legal training, most of these officials have little training in IP law and rights. The reason is that, of the 183 law schools accredited by the ABA, few offer sufficient IP law education. Of the laws schools ranked in the top 50 by U.S .News and World Report, only 17 offer one to five courses on IP, 21 offer six to ten courses, and 12 offer more than eleven courses. Of the remaining (not ranked) 133 schools, only 7 offer IP courses, though all 7 offer over eleven IP courses.

Another interesting fact emerges from this study: most law schools with a reputation of having outstandingly high standards in education have the least strong IP programs. Harvard, Yale, Stanford, and Columbia Law Schools are regarded as having the most stringent admission requirements and exceptionally high levels of education; yet, only Columbia offers a focused and complete repertoire of over ten IP courses. In contrast to this, universities in close proximity to larger metropolitan areas and areas with high technology-related industry, such as California's "Silicon Valley," Washington D.C., Boston, Chicago, and New York, are more likely to offer greater focus on IP education. These include Columbia University, New York University, Santa Clara University, UC-Berkeley, Georgetown University, George Washington University, Boston University, and John Marshall Law School.

Clearly, with the lack of development of IP education in higher education, trickle down to the secondary and high school levels is still minimal. To reach the grassroots of American society, there is a long way to go and much work to be done by the government, academia, and the private sector. IP education forms a part of the U.S. national and international agenda, and efforts are underway to improve the level of penetration.

Conclusion

With concerted efforts in developed and developing parts of the globe, there is no doubt that IP education is achieving a greater impetus and emphasis at the national and international levels. It will still be a great battle, however, to take the field to the point where it should be; grave obstacles, particularly in large tracts of the developing world, still exist.

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