them. This requires an environment that is open and safe for asking questions, forming hypotheses, and sharing ideas. The teacher’s role is to pose problems, ask questions, facilitate investigation and dialogue, and provide support for learning.

See also: Curriculum, School; Developmental Theory, subentry on Vygotskyan Theory; Dewey, John; Elementary Education, subentry on Current Trends; Piaget, Jean; Secondary Education, subentry on Current Trends.

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INTELLECTUAL PROPERTY RIGHTS

Intellectual property law, once thought of as an arcane and unpopular area of law, came to the forefront of legal disciplines in the 1990s, in large part due to the increased use of computers and the commercialization of the World Wide Web. Because of the widespread use of technology and computers to conduct research and teach, intellectual property law greatly impacts the educational enterprise in the early twenty-first century. The use of computer networks and the Web to create classrooms in cyberspace, communicate with students and faculty, write and publish scholarly material, and conduct research is considered the norm for many educational institutions. And each of these activities involves the use of copyrighted information. As a consequence educators and administrators need to have a basic understanding of copyright in order to avoid misusing copyrighted material.

Copyright Framework and Exclusive Rights

Intellectual property in the United States is a property right created by the law in intangible property. Specifically, copyright is a subset of intellectual prop-
Copyrights and patent rights originate from the Patent and Copyright Clause of the United States Constitution, which states “The Congress shall have power to . . . promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries” (Art. 1, sec. 8, clause 8). The policy behind the copyright framework, embodied in this clause, is that economic incentive, in the form of monopoly rights in an author’s work, is needed to generate new creative works in society and thus promote “the progress of science and useful arts.”

The monopoly rights that authors possess are outlined in section 106 of the Copyright Act of 1976 (the Act). These rights include the right to make copies, create derivative works, and distribute, display, and perform works publicly. The copyright owner is entitled to exercise and authorize these rights, and prevent others from exercising these rights. Unless a use is exempted or considered fair, users must seek the permission of copyright owner and/or pay license fees to use a copyrighted work.

The digital environment implicates the exclusive rights of authors quite easily. For example, every time a person saves a work to a disk, the right to make copies is invoked. Scanning, digitizing, uploading, downloading, and file transfer all involve the right to make copies. A work is publicly displayed each time someone posts copyrighted information on a bulletin board, website, or online class. When a display or performance is done through a digital network transmission, temporary RAM copies are made in computers through which the material passes.

Copyright Protection and the Public Domain

In order to qualify for copyright protection, a work must meet the statutory requirements set out in section 102(s) of the Act. The work must be an original work of authorship fixed in a tangible medium of expression. Copyright protection exists from the moment of fixation in a tangible medium. The protection is automatic and notice is not required; however, registration carries certain benefits and is required to bring a lawsuit. Section 102 of the Copyright Act of 1976 includes eight categories of subject matter that fall under copyright protection: literary works; musical works; dramatic works; pantomimes and choreographic works; pictorial, graphic, and sculptural works; motion pictures and audiovisual works; sound recordings; and architectural works. Examples of copyrighted expression also include computer programming, animations, video footage, java applets, web pages, and photographs.

An important aspect of the copyright framework is that facts, ideas, and government works are not protected. Those items are generally considered within the public domain and freely available for use without permission or payment of license fees. The logic behind this is clear. If facts and ideas in particular were considered copyrighted information, then the process of innovation, research, and scholarship would be considerably slowed due to the increased time and monetary costs of getting permission and paying fees. Moreover, the possibility of great constraint of academic freedom would be quite high under those circumstances because those who exercised control over controversial facts or ideas might be hesitant to grant access to those materials. Facts, ideas, government information, and items with expired terms of copyright are also within the public domain. To determine whether a copyright term has expired, one should consult Chapter 3 of the Copyright Act. Another helpful resource is a chart developed by Laura N. Gasaway of the University of North Carolina School of Law that helps determine when works pass into the public domain. The chart can be found online at <www.unc.edu/~unclng/public-d.htm>.

Copyright Ownership

The exclusive rights in copyright are initially given to the owner of the copyrighted work. Although the author may transfer the copyright to someone else, any analysis of copyright ownership should begin with the principle that the author is the owner. Section 201 of the Act provides four types or categories for ownership: (1) author; (2) joint ownership; (3) collective works; and (4) works made for hire.

The primary exception to the author is owner approach is the work-for-hire category. When a work is made for hire, the employer, not an employee, is considered the owner/author of a work. Section 101 of the Act outlines two ways a work is made for hire: (1) the employee creates the work within the scope of his or her employment; or (2) the work meets the
statutory criteria of being an independently contracted work made for hire.

The work-for-hire doctrine has always played a role in academic production. Many institutions have asserted ownership over research and other scholarly works by claiming the work is made for hire. However, an exception to this rule was developed in the common law for things such as syllabi, lectures, textbooks, and articles that professors write. There is no such explicit exception in the Copyright Act of 1976.

The factors to be considered in determining whether or not a person is an employee were outlined in the Supreme Court’s decision in Community for Creative Non-Violence (CCNV) v. Reid (1989). The CCNV factors applied by the U.S. Court of Appeals for the Second Circuit in Aymes v. Borelli include: the right of the hiring party to control the manner and means of creation; employee benefits provided by the hiring party; whether the hiring party has the right to assign more projects to the hired party; tax treatment of the hired party; and skill required to complete the project.

If a creator is not an employee, but is hired to create something, and both parties sign a written contract before the work begins that states the work is a work made for hire, and if the work fits into one of the statutory categories, it will be considered a work made for hire and the hiring party will own the work. The statutory categories are: contribution to a collective work; part of a movie or other audiovisual work; a translation; a supplementary work; a compilation; an instructional text; a test; answer material for a test; an atlas.

The controversy over the availability of the academic exception under the 1976 act has been exacerbated by the onset of digital distance education. Many educators claim that distance-education courses delivered online are nothing less than lecture notes, and that these items have historically been the property of faculty. Institutions counter that online courses are not developed in isolation, but that various persons help to develop them, and the institution therefore has an ownership interest in such courses. Because of the lack of clarity in this area, it is very important that colleges and universities develop copyright policies. University copyright policies can affect the application of copyright law by designating certain activities as being outside the scope of employment and/or incorporating the traditional academic exception.

Copyright Limitations and Exemptions
Although copyright owners have exclusive rights in their creations, these exclusive rights are limited by certain statutory exemptions and defenses. The most used and notable of these for the education community are: fair use, library copying, first sale, and the educational performance and display exemptions. The primary limitation in copyright on the exclusive rights of copyright owners is fair use. The fair use privilege allows for the reasonable use of a copyrighted work without permission or payment of license fees if the use is fair pursuant to statutory factors. Section 107 of the Act includes four factors that must be weighed to determine whether or not a use is fair: (1) the purpose and character of the use; (2) nature of the copyrighted work; (3) the amount and substantiality of the portion used; and (4) the effect of the use on the potential market for, or value of, the copyrighted work. All four factors are weighed or balanced, and no one factor ensures a finding of fair use. Fair use is critical to the teaching and research that takes place in educational institutions. If fair use did not exist, then the research process would be greatly frustrated, since many small and relatively inconsequential research uses copyrighted material that could be considered unlawful reproductions such as photocopying a page from a journal in order to write a research paper.

Exemptions that are directly applicable to the classroom and to distance education are located in Section 110 of the Copyright Act. The classroom exemption, 110(1), allows for the performance and display rights to be used in the course of “face to face” teaching at a nonprofit educational institution. The use must be within a “classroom or similar place devoted to instruction.” The right to public display may occur whenever a picture, graphic, text, or chart is shown directly or by means of a projecting mechanism. A performance may occur when a work is recited or acted, or when an audiovisual work, such as a videotape, is played. Thus, in the course of teaching students in the classroom one can read text out loud, sing a song, or play a movie.

The types of activities permitted in the course of face-to-face instruction under the act, as of May 2002, may not be permitted in an online class, pursuant to the distance education exemption. The distance education exemption, 110(2), allows for the performance only of nondramatic literary or musical works or the display of a work if: (1) the use is part of “systematic instructional activities” of a nonprofit
educational institution or governmental body; (2) the use is "directly related and of material assistance to the teaching content of the transmission;" and (3) the transmission must be "primarily" for "reception in classrooms or similar places normally devoted to instruction," or for persons whose disabilities or other special circumstances prevent their coming to classrooms.

The distance education provision was created in the 1970s and does not address the issues involved in transmitting content in the online classroom. This exemption does not provide for the use of audiovisual works such as educational videos, theatrical films, and film clips. The U.S. Copyright Office documented some of the limitations in 110(2) in a report given in 1999. The copyright owner and user communities have attempted to negotiate an amendment to Copyright Act, known as the Technology Education and Copyright Harmonization Act (TEACH Act). As of May 2002, the TEACH Act had yet to be adopted by Congress.

Infringement and Liability
Use of a copyrighted work without permission, unless it is covered under an exemption, infringes on the exclusive rights of the author outlined in Section 106 of the Copyright Act. Infringement can be direct, vicarious, or contributory. Direct infringement occurs when someone violates any of the exclusive rights of the copyright owner. Vicarious infringement occurs when one has the right to control the infringement of another or profits from infringement. This type of liability is based on the relationship with the direct infringer. Contributory infringement occurs when a person has knowledge of infringing activity and/or induces, causes, or contributes to infringing conduct. Educational institutions and faculty may be liable under all three types of liability.

Digital Millennium Copyright Act
Educational institutions that are heavily networked with high student and faculty use of computers need to become well versed in the liability limits in the Digital Millennium Copyright Act (DMCA), a 1998 amendment to the Copyright Act. Specifically, the DMCA limits liability for Internet Service Providers (ISPs) and provides safe harbors from liability for conduit activities, system caching, hyperlinks, directories, and location tools and stored material on an ISP system. There are specific requirements that must be met in order to get statutory protection, however. Service providers qualifying for these limits in subsections (a)–(d) are shielded from damage awards. Section 512(j) limits the availability of injunctive relief.

The DMCA has a specific provision for nonattribution of infringing conduct by graduate students and faculty of nonprofit educational institutions. This provision, 512(e), applies to the conduct of graduate students and faculty involved in teaching and research if: (1) the activities do not involve online access to instructional materials that are required or recommended for a course taught at the institution within the preceding three-year period; (2) within that same three-year period, the institution received two or fewer DMCA notifications that a particular faculty member or graduate student engaged in infringement and no actionable misrepresentations were made in connection with such notifications; and (3) the institution provides information on copyright compliance.

Anti-Circumvention
The DMCA also adds sections 1201–1205 to the Copyright Act, implementing the World Intellectual Property Organization treaty provisions prohibiting the circumvention of technological copyright protection measures and protecting the integrity of copyright management information. Section 1201 defines circumvention of technological measures and prohibits circumvention of technological measures that restrict access to a copyrighted work and trafficking in the means to circumvent protective measures restricting access to a copyrighted work. A technological measure that controls access is defined as one in which the authorized access to a copyrighted work requires either application of information (such as a password) or a process or treatment—with the authority of the copyright owner. Circumvention occurs whenever such technological measures are avoided, bypassed, deactivated, or impaired without the authority of the copyright owner.

Section 1201(d) exempts nonprofit libraries, archives, or educational institutions that circumvent technological measures controlling access to a protected work that is not reasonably available in another form. Such conduct must be for the sole purpose of making a good faith determination of whether to acquire that work. This exemption does not apply to acts that fall under section 1201(a)(2) or 1201(b)(1), which prohibit trafficking in a product or service
that is intended to circumvent technological copyright protection measures.

There is also a narrowly limited reverse-engineering exception, found in section 1201(f), for circumvention of technological measures controlling access to a computer program. The exception exists for the sole purpose of identifying and analyzing those elements of a copyrighted work necessary to achieve interoperability with other independently created programs. Interoperability is defined as the ability of computer programs to exchange and share information. This section does not exempt acts of reverse engineering, but merely the circumvention of measures controlling access.

**Computer Software**
The issue of reverse engineering as copyright infringement was litigated before the Court of Appeals for the Ninth Circuit in *Sega Enterprises Ltd. v. Accolade* (1992). The court observed that "intermediate copying of computer object code may infringe the exclusive rights granted to the copyright owner in section 106 of the Copyright Act regardless of whether the end product of the copying also infringes those rights." The court held, however, that disassembly of copyrighted object code was a fair use, since it was a necessary step in the examination of unprotected ideas and functional concepts. The court recognized that there is no "settled standard" for identifying protected expression and unprotected ideas involved in determining copyright infringement of computer software.

*See also:* Faculty as Entrepreneurs; Faculty Consulting; Faculty Performance of Research and Scholarship; University-Industrial Research Collaboration.

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