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Advances in Information Technology

Although technology has not substantially altered the role of peer reviewed journals in the allocation of credit for scientific contributions, it has been changing the ways that researchers make their findings known. In interviews, researchers noted the following changes in journal operations:

- Journals can be published electronically on the Internet. Internet publications can be adjunct to paper publication or can be the primary or exclusive form in which a journal is published. When a journal publishes both print and electronic versions, the electronic version can faithfully replicate the print journal, take extensive advantage of unique properties of electronic presentation (e.g., streaming video, links to related data), or do something in between.

- Prior to formal publication and acceptance, manuscripts can be disseminated through preprint archives on the Internet. Researchers in physics, mathematics, astronomy, computer sciences, and related disciplines reported that for access to the latest research findings, they relied on ArXiv, an unrefereed online compendium of manuscripts in their field.

- Although a journal's prestige is largely a product of the perceived quality and selectivity of its peer review process, accessibility also pays a role. Several researchers said they preferred to submit to journals that published readily accessible electronic versions, since this increased the chance that others would see their work. The viewed electronic versions that were available only long after publication or to subscribers who pay high fees as less desirable. University libraries are gatekeepers for electronic access as well as for access to print journals.

- Conducted electronically, a journal's peer review and manuscript handling processes can move more rapidly, enabling the journal to make quicker decisions about whether to accept the manuscripts that scientists submit. Because electronic processing does not materially affect how quickly reviewers can read and evaluated submissions, however, its overall effect on processing time was generally limited.

- Nonetheless, competitive pressures and technological opportunities have facilitated somewhat faster manuscript processing. Authors prefer journals that make faster decisions, and electronic administration during manuscript review gives journals greater control over their processing speeds.

- Insofar as journal review becomes faster, researchers can more easily afford to have a manuscript rejected, because rejection does not unduly delay publication.

They can initially submit to top-quality journals where success is unlikely and later submit to less selective and prestigious outlets.

- Available software enables scientists to do professional drafting for complex graphics at their desktops.

- Many researchers make their work available on their Web sites, which can be a significant communication vehicle. Web sites are unreviewed, do not established priority, and do not generate good credit. One researcher said they have “the formality of coffee shop conversation.”