Technology as a Double-Edged Sword: A Promise Yet to Be Fulfilled or a Vehicle for Cheating?

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Lars-Erik Nilsson

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Abstract

The purpose of the present chapter is to illustrate and discuss relationships between academic integrity, technology, plagiarism, and deception. Academic integrity raises conduct issues. A prevalent idea is that the purpose of the Academy is to educate students to become independent, critical thinkers. A promise of technology is that it can support the qualification, socialization, and subjectification of students. With the advent of digital technology however, it is the cheating, plagiarizing, and colluding student who is attracting increasing attention. He/she is considered to defeat the purpose of higher education and is

L.-E. Nilsson (✉)
School of Education and Environment, Kristianstad University, Kristianstad, Sweden
e-mail: Lars-Erik.Nilsson@hkr.se

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often regarded as one of the consequences of digital technology. Technology may thus be considered a threat. History demonstrates that what is considered a threat today, may very well be regarded as a valuable aid tomorrow. How technology is seen today may be different tomorrow, some practices perhaps even made obsolete or replaced as a result of new technologies, among other factors. This uneven development of academic ethos and practice is bound to create tensions between the Academy's ideas of academic integrity and its use of technology – thereby causing both to change.

Introduction

A prevalent idea is that the purpose of the Academy is to educate a particular type of person (Rider, 2013), one with deep knowledge of a particular field, independent and capable of critical reasoning, and discretionary judgment. Throughout history, different aspects have been given precedence and have influenced how actors conceptualize what this means in terms of a focus of education. "Academic integrity" is one such concept. It has a disciplinary force and influences what Biesta (2010) has termed students' qualification, socialization, and subjectification. Today's notion of academic integrity may itself be considered a result of a long course of development in which human consciousness, professional ethos, and advances in science and technology have been influential factors. Academic integrity includes judgment and discretion, rationalism and disinterestedness, critical thinking and independence. However, relationships between concepts tend to change over time (Koselleck, 2002). It is thus fruitful to regard academic integrity as a site for interaction between the parties involved in higher education, staff as well as students. Through their interaction, academic integrity is given meaning and becomes constitutive, providing ever-changing norms for conduct. Students however, may be less advantageously placed when it comes to negotiating these norms (Nilsson, 2008).

The purpose of this chapter is to explore the question of how the conceptual moralization of academic education through academic integrity may influence human use of new technology for learning and assessment. Through academic integrity, actions are normatively constrained and actors given different rights, duties, and obligations that impinge on their use of technology (Nilsson, 2008). What happens when students are governed in the name of academic integrity? Judging by the dominance of words like "cheating," "collusion," and "copy and paste plagiarism" when searching for "academic integrity" in Google, these have become prominent criteria. Following Howard (2007) and Nilsson (2008), it may be said that academy has witness a colonization from negatives that need to be debated. This is also evident from research literature that asserts that modern technology such as the Internet and mobile technologies contribute to academic dishonesty (see Akbulut, Uysal, Odabasi, & Kuzu, 2008; DeVoss & Porter 2006; Şendağ, Duran, & Fraser, 2012). With few exceptions, however only scant empirical proof, or indeed the absence thereof, is evidence that technology alters

students' conception of cheating, contributes to its increase, or hampers learning and assessment. The fact that students copy and paste from other texts does not make technology the cause of cheating but just a convenient and readily available tool, as were fraternity and sorority essay repositories in the past (Howard, 2007; Nilsson, 2008).

Technology and Academic Integrity

A common assertion in the sociology of science and technology is that science and technology are constructed cultures (see Hughes, Pinch, & Bijker, 1987). The boundary between academic integrity and technology can thus be said to be a matter for negotiation. Exactly how students will use technology in their future professional lives is impossible to say; nor is it possible to know how these uses will be valued in ethical terms in the future. The promises of technology, and whether these should prompt academics to change their views of what is ethical, are rarely highlighted in studies on academic integrity. Internet technology can contribute to a positive development when used proactively for the purpose of instruction and training, supporting searching, writing, data collection or analysis of data. Instead, positive use of technology becomes use of technology as an antidote to a threat, and the introduction of plagiarism detection services, ip-tracking, and camera surveillance are regarded as technology prevention or detection to monitor student activities (see Apampa et al., 2010; Graham-Matheson & Starr, 2013; Sheshadri, Redy, & Kumar, 2012).

The Uneven Development of Academic Ethos and Practices

The chapter will proceed from the assumption that there is an inherent tension between academic integrity and technology. This tension influences what will be termed "the uneven development of academic ethos and practice." The suggested unevenness is manifest in many relations such as that between ethics and rationalism, knowledge and utility, and learning and assessment. Resistance to technology is common (Bauer, 1997). In modern times, however, it is also common to see technology as a means of strengthening learning (Underwood & Farrington-Flint, 2015). Berners-Lee and Cailliaus's (1990) World Wide Web may, from such a perspective, represent a dream about technology that would alter the way mankind shares data and facilitates access to others' research. Word processors may represent the dream that we can all write using perfect spelling and grammar and move text "effortlessly" to construct new and better texts. Designers of technology and software who collect and analyze data dream of better ways to aid research. To designers such features are valuable aids, but in the present tradition of argumentation about academic integrity, they can also be construed as vehicles for cheating, and the design to entice students to let technology do the work for them, helping them to plagiarize and to collude.

Clearly, there is tension between the promises of technologies and the ways in which the Academy today construes honest and dishonest academic practices. As Underwood and Farrington-Flint (2015) suggest, education need to find the good ways. However, as already established, what is good and bad is a question of negotiation of the boundaries between academic integrity and technology. Tension between academic integrity and technology therefore has the potential to invite educators to think of relationships that are more complex and where the two are mutually constitutive.

The Swedish Context

Some features of Swedish society indicate that Sweden should be an excellent site to explore a relationship between academic integrity and technology. When it comes to technology, Sweden's aim is to be number one (Prop, 1995/96). Phrases such as "Wings to human abilities" (SOU, 1994, p. 118) and "Tools for learning" (Skr, 1998) naming political documents hint at how Swedish politicians view the promise of technology. A successful introduction of Internet technology was presented to citizens as essential to Sweden's survival as an affluent society. The introduction of Internet technology into education was considered one of three strategic steps on the road to Sweden becoming one of the world's leading knowledge economies together with legal issues and information management (Prop, 1995/96, p. 125). From this perspective, it should not come as a surprise if promises of technology for learning become more important to the development of academic practice in Swedish institutions than potential technological threats such as cheating, plagiarism, and collusion – at least until such time as it is proved that technology does indeed represent a threat.

Academic Integrity and the Swedish Disciplinary Ordinances

When higher education was institutionalized in Sweden in the sixteenth and seventeenth centuries, universities had jurisdiction over many aspects of university life, including student conduct (Johannesson, 1982). Examples can indeed be found of the university council sentencing students to decapitation. In 1852 most legal issues were transferred to the national legal system but student discipline remained a university jurisdiction (SFS, 1852, p. 20). A rule including deception was inserted into the disciplinary ordinance of 1958 (SFS, 1958, p. 327) and into the Higher Education ordinance of 1993, which defined cheating as using "prohibited aids or other means attempt to deceive during examinations or when academic work is otherwise assessed" (SFS, 1993, p. 100, ch. 10, § 1.1). "Aids" and other means included a broad range of technologies.

The 1958 amendment makes transgression contingent on what constitutes "deception" in particular examinations. In this regard, Swedish legislation is anti-essentialist. It is not the use of technology or plagiarism per se that is to be

sanctioned, but deception. This means that individual teachers can decide on how they will deal with the use of technology, but never how to deal with what they consider to be "deception." Well-founded suspicions of deception must always be sent to the Vice-Chancellor's office; the disciplinary committee is the only entity with the power to suspend. Glendinning's (2014) comment that in the case of Sweden, decisions on whether plagiarism has occurred are taken at an institutional level is thus misleading. Decisions are based on whether or not deception has occurred. Discretionary judgment thus becomes an important factor in the discussion of a relationship between the use of technology and academic integrity.

Honesty and the Swedish Student

Honesty as a national trait is another feature. Most Swedes consider themselves to be honest (Daun, 1989). Sweden, like other Scandinavian countries is ranked high on the list of least corrupt countries in the world. While international surveys suggest that student cheating is prevalent, involving half the student population, Swedish students have been perceived to be relatively honest. Almost a century ago Parr (1936) could write that "students who claimed to be of Scandinavian descent were much more honest" (p. 321) than any other nationality. Teixeira and Rocha (2010, p. 676) published a comparative study that showed that only an average of 5 % of Scandinavian students declared that they have a propensity to cheat. Only recently, a report from the Chancellor's office shows that only 2 out of 31 higher education institutions had more than half a percent of the students warned or suspended for deception in the context of examinations (UKÄ, 2014).

Tensions between Academic Integrity and Technology

To my knowledge, there is no study that establishes that there has been any change in Swedish student attitudes towards cheating as a result of new technology. Discourse on student honesty has yet to change in such a way that technology presents a danger to integrity. Reports from the Swedish Higher Education authority, from the media and/or local seats of learning indicate that such a change is imminent (TT, 2015; UKÄ, 2014, 2015). It is only recently that Swedish higher education has perceived a threat to academic integrity from technology. The reports from the Swedish Higher Education Authority do not single out any particular technology, but the media report an increase in cheating; and reports describing Internet and cellphones as aids for cheating are legion. Also, a search for cheating AND student AND Internet AND cellphone returns hits on policies and instruction from most Swedish higher education institutions. Furthermore, the use of technology featured prominently as an ethical dilemma in disciplinary cases reported by Nilsson (2008) as well as video-recorded work sessions reported by Nilsson, Eklöf, and Ottosson (2008). Interestingly, antiessentialism leaves Swedish society and the Academy open to reconstructing what constitutes academic integrity (Nilsson, 2008). For example,

any action or use of technology may be constituted as acceptable or unacceptable depending on the instructions for the particular test. Swedish teachers are at the center of tensions regarding technology as a threat or as a promise.

Tensions Between Technological Threats and Promises

Swedish examples illustrate how "the uneven development of academic ethos and practices" can cause tensions. One way to frame tensions between academic integrity and technology is as a struggle between students and staff over what is to be permitted, and what is to be forbidden. A story illustrating this dilemma appeared in the Swedish author Erik Bengtson's (1987) fictional book *Vad rätt du tänkt* [Your righteous thoughts], based on a true story. In 1906, two enterprising students manufactured formularies small enough to hide in the palm of a hand or a stocking. They sent marketing letters to class monitors at Swedish senior high schools. Records of the incidents, found in The Swedish National Archives (Riksarkivet) indicated that a headmaster at one senior high school in southern Sweden was handed the marketing leaflet. He wrote to his peer asking what was going on (Nilsson, 2008). First, the students were expelled but then reinstated.

The same records hold a copy of the small book containing the formularies. The case suggests that in 1906, formularies were regarded as unauthorized aids in Swedish examinations. Suspicions about cheating developed because of the small size of the formularies and the assumption that these students were producing a cheating aid. What other reason could they have to make a palm-sized version? The point is that the students were not the first to publish formularies. In Sweden, Liedstrand (1903) had already published a collection, and other publishers followed suit. Only a few decades later, Kruse (1933) published a pocketsize version. Formularies had become important aids and by the 1960s were commonly allowed as aids in assessment. In the 60-year period spanned by these events, the sociotechnical dilemma was solved by the commercialization of a technology, new ways of conceiving of the use of memory aids to help students learn and succeed and new, permissible designs in examinations and materials. By altering ways of thinking about technology and its uses, a threat had been neutralized and one of technology's promises had been fulfilled.

Tensions and Cheating Slips

The latest report from the Swedish Higher Education Authority on disciplinary cases in higher education (UKÄ, 2014) reveals that more than 100 students were suspended or given a warning for using cheating slips and other unauthorized aids in examinations. That modern technology is seen to cause problems can be inferred from the comment that many students were sanctioned because their cell phone was turned on during examinations. Increasingly powerful yet smaller devices appear to be conceived of as a threat to academic integrity. Allegedly universities were

terrified that the new apple watch would help students cheat; it was thus decided to ban smartwatches from examination halls (Pandey, 2015).

One important task in education is qualification. Students need to gain knowledge, understanding, and competence (Biesta, 2010). They must also be prepared to demonstrate what they have learned. When Swedish students spend time preparing for tests, one important learning aid is old tests. Legislation ensures that these are publicly available. Students team up to study for future tests. Several hours spent by the author since 2009 observing students in libraries and hallways and writing field notes show how this is done. Questions that demand a factual answer, a definition or a formula only appear to be a problem if it is needed to be stored in an individual's memory. Questions that need an explanation or that the students provide supportive arguments for, call for other strategies; students must thus muster all the support they can get. They try to acquire answers from previous years, debate their merits and help each other find the best answers. In order to evaluate answers, students spend a lot of time searching books, the Internet, slide shows and even consulting experts online (Eklöf, Nilsson, & Ottosson, 2014). Students often describe this way of working as a means of giving new perspectives on their readings. They spend hours selecting the best information, scrutinizing, organizing, and finding efficient ways to store what they have learned. Students participating in the observed sessions often said they remember arguments they had not noticed before when they studied on their own and/or had not understood the significance of such arguments when first mentioned by their teachers.

Engeström (2006) comments on this way of preparing for tests in terms of using cheating slips. Students' preparation of cheating slips introduces a tension between notions about academic integrity and technologies used for learning. Engeström refers to this practice as "double stimulation," the first stimulus being the examination question and the second the mediating tool, i.e., the cheating slip. To "create a good cheating slip, the student must carefully select the most relevant and useful aspects of the topic, and represent them in an economic and accessible way on the slip" (Engeström, 2006, p. 19). Drawing on Vygotsky, Engeström suggests that students are "creating an external auxiliary means for mastering an object." Modern technology, however, can be used by students as advanced organizers and, if well designed, often amplifies one's memory and thinking. A system for assessment that recognizes such work as useful learning would exploit this feature, allowing for advanced organizers and boosting student learning. Following the present tradition of argumentation that constitutes the use of such slips as cheating, the use of advanced organizers becomes impossible. Again, by altering current ways of thinking about technology and its uses, a threat can be neutralized and a technological promise fulfilled.

Tensions and Collaboration

One area where "the uneven development of academic ethos and practices" causes tension between academic integrity and technology is collaboration. Relatively few students in Sweden are sanctioned for unauthorized collaboration (UKÄ, 2014).

In 2012, more than 100 students were suspended or warned but in 2013 only around 50. The collaboration-collusion continuum introduces a special difficulty for the Academy. Students need to be socialized into the particular moral orders of their future professions (Biesta, 2010) and become aware of how work is carried out. In the 1930s, Swedish teacher media articles debated whether collaboration in education should be thought of as a good thing or as cheating (Nilsson, 2008). Today, drawing on Vygotsky's (1962) idea that students have a "proximal zone of development" (ZPD) it is commonly understood that students can reach their ZPD through guidance from those who know more, whether teaching staff or their peers. It is also common in Swedish classrooms to have students collaborate in what Eklöf et al. (2014) describe as a "connected solitude." Using modern technology, students collaborate; collaboration may, however, put them at risk of being accused of collusion.

An anecdote taken from real life and relating to data gathering in a library can illustrate the problem. Students were given individual mathematics tests to complete. They knew that the assignment was an individual exercise in which the problem must be solved using course books and lecture notes. Despite this, the students immediately engaged in social networking. For a few hours they discussed examples, and posted and critiqued answers to the problems with their peers. When asked if they considered this to be collusion, they replied that it is impossible to cheat because the assignment is followed by an oral exam in which students not only present, but argue their individual solutions. They framed both physical and virtual meetings as meetings where students can discuss how they should solve the tasks. They saw those who just copied not so much as cheaters but as stupid, because they would not have the understanding required to pass the oral test. There are similarities to student learning as described by Engeström (2006) where the assignment provides the first stimuli and the affordances of Web 2.0 the second stimulus. Studies show that students collaborate in this way in distributed physical spaces and where technology helps them to meet a variety of academic demands (Eklöf et al., 2014; Richardson, Hamilton, Gray, Waycott, & Thompson, 2012).

Another case suggests that technology only reveals a tension that is already in existence. Two students from a special education program handed in identical essays and were reported for collusion. It was clear from the instructions that they must hand in individual reports. Their assignment was to carry out a pedagogical investigation and design an individual plan for a student. Since the two shared the same student, they decided to work together and to do "something useful." In accounting for their actions the students admitted to having worked together but argued that they had done the expected work, arguing that their actions were justified because the work they had done could be used later in their profession. They were found guilty of deception and suspended from studies (HKR registry 986/329-08).

Cases where students have been formally accused of deception in the form of collusion can cause confusion and bewilderment. Drawing on interviews with 17 students who had undergone disciplinary committee processes and been found "guilty" of various acts of misconduct, Sutherland-Smith (2013) concluded that

such disciplinary action does not clarify for students what constitutes acts of collusion. The Academy has yet to respond to this problem in a meaningful way. Pedagogically sound use of technology appears to become short-circuited by demands in this case for individual assessments. Sutherland-Smith argues that being involved in disciplinary committee processes does not teach students the limits of collaboration but fosters a reluctance to take part in discursive group work and that "clearly, the promised learning outcomes at discipline and university levels, in terms of collaboration and team work, are far from realized by these students" (p. 57). As already demonstrated, to neutralize a threat from technology academy needs to alter its ways of thinking about technology and realize its potential to support learning.

Tensions and Plagiarism

Plagiarism is commonly considered to be a threat to academic integrity. It is well known that there are differences between cultures and disciplines as regards what constitutes plagiarism (Pecorari, 2008). It has also been established by Ashworth and Bannister's (1997) seminal study that it is unclear what plagiarism actually means to students. Globalization forces Swedish and other students to work with English texts. Swedish students write in English and translate into Swedish. What kind of actions should be permitted and disallowed when they work with their second language?

In 2014, a Swedish student was reported for plagiarizing (HKR registry U2014-29-1119). The student submitted an essay with a review and reflection section on a specified paper that would be characterized as a patchwork (see Howard, 1995, for a definition of patchwriting). Many of the patches had been translated in Google translate; the student did not claim original authorship. The teacher was alerted to the machine translation by a footnote converted to a number in the translated sections. The student argued that the text was difficult to understand and since this was not a test of the ability to translate, but rather, to reflect, then using machine translation was acceptable. Elsewhere in the essay, the student used poor paraphrases, without citation marks, but always differentiated in some way between his/her own point of view and that of the author. The disciplinary committee ruled that this should not be called deception and left the decision to pass or fail to the grading teacher.

Referencing is sometimes considered such an easy and standard task in higher education that any student qualified for tertiary study should master it (Standler, 2012). However, there are many different standards used in different disciplines and Internet technology affords new ways to attribute sources not yet accepted by the Academy. In 2012, a Swedish student handed in an essay of a factual nature, containing a passage the marker recognized from a report, which had been copied word for word. The report was not mentioned in either the in-text citations or in the reference list, and citation marks were not used. Instead, there were links in parenthesis that the teacher could not follow and a reference to the page in the reference list. The student was reported to the Vice Chancellor's office for

plagiarism. The investigation showed that the links worked and directed the reader to the text the student had used. The teacher maintained that the student's work should still be considered as cheating as the discipline-specific rules for referencing had not been followed. The disciplinary committee ruled that the student's actions should not be considered deception because the student had linked directly to the source. It was ruled that the violation of disciplinary conventions was of a kind that could be dealt with by the grading teacher (HKR registry).

Angélil-Carter (2000) asserts that students often think that providing references displays their mastery of a subject. It can be argued that the student in the previous paragraph provided sufficient information to show understanding of the subject. Direct linking to Internet pages perhaps challenges traditional views of what citation conventions should be. This techno-threat is yet to be neutralized by new ways of conceptualizing academic integrity. Howard (2007, p. 4) takes the view that the Internet "undisputedly makes text readily available for plagiarizing" but that educators should "take the question further, looking at the ways in which the Internet participates in our culture of authorship." As illustrated above, it is not just texts in a narrow sense that are made available but also empirical data, models, software code, term-paper sites, sites with templates for production, services for translation, for summarizing, and for text comparison. Most of these can be used productively as a second stimulus to support student interaction with text. A few of them should be banned because they rule out student interaction, e.g., the downloading of a paper for purchase from term paper sites (see Lancaster and Clarke in the present volume).

What's Technology Got To Do With It?

Technology alters how people do things and how they think things should be done. At the end of the day, what matters is how they perceive of technological affordances. An argument already discussed is that an uneven development in professional ethos and practices introduces a tension between learning and assessment. Aids thought to be natural in learning such as the law book, the formulary or the scientific calculator may, at any given historical period, be called tools for cheating, only later to be considered indispensable and thus permissible aids. In sociocultural theory, word processors, search engines, and referencing systems are mediating tools. Jonassen (2000) describes them as "mindtools." They act as intermediaries that can help develop and extend human minds. An implied argument is that as professional practices change professionals rely on them to carry out their work, e.g. an electronic journal to store information about a patient. They enhance students ability to store and organize content, serving as advanced organizers (Engeström, 2006). Valuing them for learning but considering them unauthorized aids in tests can be seen as yet another example of an uneven development of ethos and practice.

Another argument introduced is that learning is a social process and that humans realize their potential thorough guidance from those whose knowledge is greater. Social networking tools improve humans' abilities to communicate and collaborate,

providing blogs, and allowing joint editing and collaborative mind mapping (Richardson et al. 2012). Furthermore, professional work depends on collaboration. Students are socialized into using tools for collaboration in the learning process. To disallow them during assessment radically alters the context for representing knowledge and may also, as suggested by Sutherland-Smith (2013), confuse students about when they may collaborate and when not, during an assessment task.

That raises the question: what about plagiarism? There is nothing "natural" about referencing in academic writing. What academic integrity brings is contemporary understanding of what it means to use text in an ethically responsible manner. When foot-notes first appeared, they were the result of an adaptation of hand-written marginal notes to book-printing technology (Grafton, 2003). There was a heated debate about their use at the time, which continues to this day as technologies shift yet again. Since the advent of printing technology, texts are enumerable and referencing makes sense as a means of signaling dependence, paying homage, guiding readers, and in assessing as a means of indicating mastery of the field. This does not mean, however, that referencing is here to stay, at least not in its present form.

Modern technology introduces an almost endless array of tools that can be used to search, manage, and represent information. Berners-Lee and Caillíaus (1990) dreamed about technology that would make it possible for research to be linked together in a smooth way so that relationships between projects and the development of knowledge could be tracked. Ambitious projects such as Google books have been set up to publish previously printed texts on the Internet and most publishers have made their archives searchable for the general public. Many universities and funding agencies now demand that research is published using Open Access. Technologies of this kind speak to the positive side of academic integrity, to communalism and universalism. It can be argued that the promises of the Internet invite academics to change the way they think about referencing. The architecture of the Internet radically alters the conditions for referencing in academic work. Searches in search engines take academics a long way towards finding the original behind the texts. Kane (2008) writes that plagiarism has become virtually impossible in physics research since Open Access publishing in ArXive began, because the archive has made everybody aware of what everybody else publishes. Electronically published journals often include direct links to texts from in-text citations and to references in the reference list. Some journals even embed data to make analysis of video and audio data more transparent. In the not too distant future, readers may have tools that will suggest the most likely sources behind any section of a text, leaving all authors open to accusations of plagiarism.

Fighting a War that Cannot, and Perhaps Should Not, Be Won

Using war metaphors in education seems awkward but when it comes to contemporary discourse about cheating they are legion. That there is a war to fight follows logically from the theoretical assumption behind this chapter. That it is a war that

has reached Swedish higher education can be inferred from the rather limited Swedish research. Trost's (2009, p. 371) research on cheating in Swedish higher education supports the conclusion that a large number of students at Swedish HEIs perform actions classified as cheating in the survey instruments. Findings show that 81 % of the 322 students surveyed at 3 universities lied in order to get special consideration and 61 % declared that they copy without acknowledging sources. Altering and inventing data, however, are rarely admitted to by students. Furthermore, (Hallonsten, 2007) states that many students have a lax attitude toward some forms of cheating, and Colnerud and Rosander (2009) suggest that students tend to accept some forms of cheating as reasonable, as long as they have done the required work. From this perspective, their reception of technology may become a problem.

Following Suen and Yu (2006) this is a war that has to do with consequential validity and it has been going on since the dawn of assessment. Institutions will set up rules for academic integrity that will be transformed into rules governing how technology can be used in learning and assessment. Students will challenge and sometimes deliberately break the rules, they will be guided by grade point average perspectives (Becker, Geer, & Hughes, 1968), they will be cue seeking (Miller & Parlett, 1974), and sometimes they will even cheat. Technologies to prevent, detect, and deter deception have also been commonplace, from the cells in Chinese literary examinations (Elman, 2000), the proctored tests in England (Hilton, 1904), the seating arrangements (Houston, 1986) to the current use of biometrical authentication (Rose, 2011), and plagiarism detection systems (Nilsson, 2013; Purdy, 2009, Weber-Wolff, 2012). Dows (2005) writes about the efforts to control the pre-examination, examination, and post-examination phases and invites academics to think about technology as a means of taking control of a chain of action that starts with test design and ends with the protection of material during grading and redistribution.

The battle continues in the form of endless attempts to control technologies and their textual outputs. When students copy and paste texts without citing sources, higher education institutions introduce the use of plagiarism detection systems. As a result, students take counter measures, such as changing words and word order or inserting uncolored characters into their texts. When these methods are discovered, as eventually occurs, students may turn to contract cheating (see Lancaster and Clarke in the present volume) or summarizing systems, which can be easy to use but are difficult to detect by staff even with technical assistance. Technically, well-informed students are highly unlikely to be caught. Heather (2010) argues that the best way to attack plagiarism detection software is to stop a text from being properly extracted, suggesting three methods using PDF-files. The first one involves modifying the character map, the second rearranging the fonts in a glyph and the third converting texts to Bézier curves. The result, in all cases, will be that the software will look for something that cannot be found. A skilled student can decide which text overlap should be found and which must remain hidden. Technology is indeed a double-edged sword.

The third aspect of the battle metaphor, i.e., that the conflict should not be won, is perhaps more problematic. It stems from the understanding that students are

being educated for professional work. Professional work is fundamentally judgmental. Therefore, not only should students become qualified and socialized, they should also become subjects in their own right and be prepared for discretionary decision making that transcends the professional moral order. This is a prerequisite for being able to expand on the existing knowledge of the profession. Whereas discourse on academic integrity often presents modern technology as a threat that can cause students to cheat, collude, and plagiarize (see, for example, Bonderup-Dohn, 2009; DeVoss & Porter, 2006; Underwood & Szabo, 2003), here it is argued that "the uneven development of academic ethos and practice" presents a tension between academic integrity and technology that needs to be resolved. Engeström suggests there are good and bad ways to cheat, good cheating being, "a way to beat the system to be more clever than the given activity" (2006, pp. 19–20). Good cheating will always involve doing the work and learning before doing the test. Bad cheating is just copying answers for a test, buying a term paper or letting someone else do the test for you, none of which will contribute to the student becoming a professional capable of making independent and informed decisions.

In Swedish legislation, deception is always relative to instruction. It is seen as morally reprehensible to intentionally use aids or collaborate when it is forbidden. Sometimes restrictions will be placed on the use of technologies that do not make sense to students. It does not matter whether students demonstrate understanding – if their work is more authentic and useful, or even if their use of sources is more insightful – if they willfully violate the instructions. Much debate concerns how to adapt technology to fit present understandings of academic integrity. Should then academic integrity be adapted to fit new technology? Should, for example, the Internet be allowed to influence current views on how to reference other peoples' texts, as have other technologies? Although there may be little support for the idea that academic referencing as it stands is outmoded, Internet and hyperlinks may very well make present forms of referencing redundant, replacing current referencing conventions with arguably superior hyperlink-based forms of attribution. Such shifts in thinking may also mark the end of present ways of conceiving of plagiarism and collusion. If present understandings of what constitutes academic integrity do not change, education will be unable to deal with processes where something unexpected is created and subjects change their lives without adhering to the preconceived courses of acceptable progress and improvement (Engeström, 2006, p. 20).

Summary

It has been argued, academic integrity is a site of interaction between management, staff, and students about the evolving uses of technology. Technology will always challenge the Academy's views on what is good and proper. Whether academic integrity should continue to demand from writers that they reference sources used in in-text citations and reference lists (as it is today) or that referencing should be carried out through hyper linking (as already exists in many institutions) cannot be

answered. Technology supports both solutions. Students are trained for judgment-based work. Whether the Swedish examples illustrate that students are positioned as cheaters or as thought leaders in uses of technologies to come, only the future will reveal. History, however, tell those interested that students will always try to adapt their behavior to assessment in order to succeed. For some students, this means changing their test behaviors in ways that may corrupt the test results (consequential bias) and for a few, this means engaging in cheating behaviors. When there are large differences between how technology is used for learning and assessment, the Academy is likely to experience conflicts that cannot be resolved by technology alone. When, as often happens, there is talk about the threat from digital technology there is a need to recognize that technology is a double-edged sword and institutions must carefully consider how they will approach its use in academic integrity issues.

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