Violation of digital and analog academic integrity through the eyes of faculty members and students: Do institutional role and technology change ethical perspectives?

Ina Blau[1] · Shira Goldberg[1] · Adi Friedman[1] · Yoram Eshet-Alkalai[1]

Abstract

This study aimed to address the gap in the literature through a comprehensive comparison of different types of violations of academic integrity (VAI), cheating, plagiarism, fabrication and facilitation (Pavela in J College Univ Law 24(1):1–22, 1997), conducted in analog versus digital settings, as well as students' and faculty members' perceptions regarding their severity. The study explored differences in perceptions regarding students' VAI and penalties for VAI among 1482 students and 42 faculty members. Furthermore, we explored the impact of socio-demographic characteristics (ethnic majority vs. minority students), gender, and academic degree on the perceived severity of VAI. Presented with a battery of scenarios, participants assessed the severity of penalties imposed by a university disciplinary committee. Furthermore, participants selected the penalties they deemed appropriate for violations engaged in by students, including: reprimanding, financial, academic, and accessibility penalties. All participants tended to suggest more severe penalties for VAI conducted in traditional analog environments than for the same offenses in digital settings. Students perceived all four types of penalties imposed by the disciplinary committee to be significantly more severe than faculty members. Moreover, findings demonstrated a significant difference between faculty and students in both perceptions of the severity of VAI and in relation to suggested punishments. Consistent with the Self-Concept Maintenance Model (Mazar et al. in J Mark Res 45(6):633–644, 2008) and Neutralizing Effect (Brimble, in: Bretag (ed) Handbook of academic integrity, SpringerNature, Singapore, pp 365–382, 2016), ethnic minority students estimated cheating, plagiarism, and facilitation violations as more severe than majority students. The theoretical and practical implications of the findings are discussed.

Extended author information available on the last page of the article

Introduction

Violations of academic integrity (VAI) have become increasingly prevalent among students in education systems across the world. VAI involve one of the following four general categories of behavior (which will be discussed in the next section): cheating, plagiarism, fabrication of information, or facilitation of such misconduct (Pavela 1997). For instance, in a study of more than a thousand university students in Romania (Ives et al. 2017), about 95% reported having engaged in one or more VAI. This phenomenon continues to preoccupy researchers and educators in the hopes of reaching a greater understanding of its determinants and of finding effective methods of reducing its scope. Findings reported by Peled et al. (2012) indicate that 3/4 of 1500 faculty members from Israel, Germany and the US perceived VAI as a problem at their colleges and universities. A vast majority of faculty members reported having considerable leeway in handling instances of VAI involving students within their institutions. In addition, 3/4 of this very large sample of respondents perceived VAI as a problem within their department or school. These findings are consistent with a shift in research on VAI around the globe—from looking at student behavior and characteristics alone to focusing on the roles played by instructors, instruction style, academic practices (Fishman 2016), and evaluation methods (Thomas and Scott 2016).

Although VAI is an extensively researched phenomenon, there is a gap in the literature regarding the systematic comparison between VAI conducted in traditional, analog settings (i.e., non-digital face-to-face or handwritten paper-based contexts) and VAI conducted in digital settings. The recent COVID-19 pandemic has forced faculty members to experiment with online assessment by integrating proctoring tools or/and changing the nature of the exams and requiring students to apply the study material. This highlights the importance of reaching a deeper understanding of digital VAI and of raising faculty awareness in relation to these offenses.

This study aims to address this gap by comparing analog versus digital VAI in order to understand the role that digital environments play in this phenomenon. Moreover, previous studies mostly focus on either the perspective of instructors or of students, rather than mapping the gap between the perspectives held by different stakeholders regarding the same phenomenon. This study explores the perceptions of both university students *and* faculty members from a large Israeli university regarding the severity of different types of VAI conducted by students and the penalties for these types of misconduct.

The following sections first present the conceptual framework for the different VAI explored in this study and the prevalence of VAI. Following that, we discuss how these misconducts may differ in analog and digital environments. We conclude the literature review by addressing strategies for preventing and coping with VAI.

Types of violations of academic integrity

This study adopted a comprehensive conceptual framework of VAI, which was proposed by Pavela (1997). The framework distinguishes between four types of VAI: (1) *Cheating*—the intentional use of study materials, information or any kind of aid, the use of which is not allowed, including consulting others; (2) *Plagiarism*—the use of text, images, figures, tables, and other types of content created by other people, presented without crediting the source, as if it were one's own; (3) *Fabrication*—the intentional fabrication of information and data that do not actually exist; and (4) *Facilitation*—intentional assistance in VAI of any type conducted by others. This moadel was chosen since it is widely used and encompasses a wide range of VAI in comparison with other models (for review of the categorizations of VAI types see: Blau and Eshet-Alkalai 2017).

Pavela's framework of different VAI types was introduced before the massive integration of digital technologies for communication and information-sharing in teaching and learning practices. Consequently, the model does not distinguish between offenses conducted in analog versus digital settings. Findings among school students (Blau and Eshet-Alkalai 2017) provide contemporary empirical support for the validity of Pavela's conceptual framework in exploring the phenomenon of VAI in both analog and digital learning environments. This study reported that all four types of VAI, described by Pavela, exist in the classroom and are conducted in both digital and non-digital settings. Furthermore, no additional types of VAI were revealed. Similar results were obtained in a separate qualitative study in which teachers and students' parents were interviewed (Blau et al. 2014; Rotem et al. 2016). In contrast to studies conducted in the education system, additional studies which examined VAI in higher education through an analysis of the disciplinary committee's protocols at a large university revealed only three out of four types of VAI (Etgar et al. 2019; Friedman et al. 2016a, b). These protocols, which include all of the offenses examined by the disciplinary committee over either 1.5 or 4 years, contained no cases of fabrication in either analog or digital settings. Such inconsistencies in previous findings call for further examination of VAI types in higher education based on Pavela's comprehensive conceptual framework. The researchers hypothesized that these surprising results can be explained by the chosen methodology—analysis of cases that were caught and punished by the disciplinary committee. Namely, in contrast with other VAI types (e.g., plagiarism), it can be difficult to identify and prove students' fabrication of data or arguments in their university work.

Some factorial analytic studies of VAI have used different terminology but have provided support for Pavela's categorization of VAI. For instance, a study on VAI conducted among Turkish undergraduates (Akbulut et al. 2008) revealed components termed fraudulence, plagiarism, falsification, delinquency, and unauthorized help. Apart from delinquency, which is not necessary associated with VAI, fraudulence is equivalent to cheating, falsification to fabrication, and unauthorized help to facilitation in Pavela's terms.

The prevalence of violations of academic integrity

VAI have been found to be prevalent in different countries, among students from different academic fields, and at different educational levels. For example, a study of 1500 undergraduates from a variety of American universities and colleges (Carpenter et al. 2010) indicated that 80% of the participants had conducted at least one of the VAI cases that were presented to them. An additional study focused on the academic misconduct of plagiarism (Teixeira and Rocha 2008) and found that among approximately seven thousand economics and business students from a variety of universities in 21 different countries across the globe, the majority admitted having copied at least once. While this study examined VAI among business students, a study conducted in Croatia examined VAI among almost 700 medical students and found that 97% admitted having engaged in some type of VAI (Kukolja Taradi et al. 2012). Furthermore, while the studies described above found that VAI was prevalent in higher education, research has indicated that it is present in high school as well. For example, a study conducted on cheating in high schools in advantaged areas of the West Coast in the United States, found that more than 90% of the students had engaged in VAI at least once (Galloway 2012).

Studies on VAI in the education system in Israel reveal a similar trend to that reported worldwide. For example, Cheshin (2006) found that approximately 95% of higher education students in Israel admitted having been involved in some type of VAI, the majority of whom had been involved in copying papers and/or cheating on exams.

Regarding the reasons for engaging in VAI, a study conducted at a large Israeli university indicated (Friedman et al. 2016a) that almost 60% of students who were charged with VAI claimed that they had acted innocently, in the belief that their behavior was acceptable. Moreover, a study among Israeli school students (Blau and Eshet-Alkalai 2017) revealed that the pervasiveness of VAI was significantly higher than the perception of its legitimacy. This suggests that even when academic offenses are *perceived* as unacceptable, it does not necessarily prevent students from actually engaging in such offenses. If this issue is not addressed, students are likely to suffer from "ethical dissonance" (Etgar et al. 2019; Sidi et al. 2019), i.e., the gap between ethical standards and actual behavior, while continuing to behave unethically.

Violations of academic integrity in the digital era

By the end of the twentieth century, the internet had increased access to information, and enabled its dissemination to an unlimited number of learners, who could edit and share it using a variety of tools (Nilsson 2016). However, in addition to its benefits, the availability of online information has contributed to students copying from the internet or peer-to-peer sharing as an easy way of completing their academic studies successfully (Rogerson and Basanta 2016; Sutherland-Smith 2016). Moreover, digital plagiarism is further encouraged by

the availability of websites offering help in preparing study assignments, as well as the option of "contract cheating" and buying academic papers online (Newton and Lang 2016; O'Connor 2003). Thus, alongside the great advantages of digital technologies in promoting learning processes, they also increase the prevalence of digital VAI (Etgar et al. 2019) because of the great accessibility of information and the almost unlimited capacity to edit and disseminate it (Stephens et al. 2007).

The characteristics of the digital technologies described above, as well as the anonymity of authors' identities (e.g., in Wikipedia) in many cases, often lead to blurred ethical boundaries in students' perceptions of acceptable academic behavior. Blurred ethical boundaries may lead students to engage in VAI in order to attain high achievements with minimal effort (Alroi-Stein 2008; Newton and Lang 2016). Indeed, a high percentage of teachers and students have been found to perceive copying information from the internet as an acceptable behavior, rather than a punishable offense (Baratz and Reinhold 2008). Furthermore, findings suggest that digital VAI may be perceived as more acceptable than analog VAI. For example, Blau and Eshet-Alkalai (2014, 2017) found that plagiarism and facilitation are perceived by middle school students as more acceptable behaviors when the VAI are engaged in using digital tools, compared to analog tools. Thus, the use of technology may pose ethical challenges that students have difficulty coping with. Indeed, Lathrop and Foss (2000) found that the more advanced the technology is in terms of the facility to copy, edit and disseminate material, the lower the ethical standards of students.

Other studies distinguish between the main effect of technology on VAI on the one hand, which they usually fail to demonstrate (e.g., Blau and Eshet-Alkalai 2017; Friedman et al. 2016a), and the interaction effect between the technological factor and VAI type on the other hand (Sidi et al. 2019). For example, Blau and Eshet-Alkalai (2014, 2017) expanded Pavela's (1997) conceptual model described above to examine VAI among school students with and without the use of digital tools. They found a significant interaction effect between the technology factor and violation type. Namely, digital plagiarism was more prevalent than analog plagiarism, whereas analog cheating and fabrication were more prevalent than digital cheating and fabrication. A study by Cheshin (2006) found that digital plagiarism was the most common form of VAI among students in higher education settings. In a study that compared integrity in analog versus digital academic environments according to the protocols of a university's disciplinary committee (Friedman et al. 2016a), cheating was found to be more prevalently conducted in analog settings, whereas plagiarism was more prevalently conducted digitally. Nonetheless, the vast majority of the offenses, both analog and digital, which were sentenced by the disciplinary committee, involved cheating (78%), whereas only 17.5% involved plagiarism. Thus, findings from the study conducted by Friedman and colleagues indicated that digital cheating was more prevalent than digital plagiarism. Inconsistent findings reported in previous studies call for use of an appropriate methodology that would enable researchers to explore the interaction effect between the use of technology and the different types of VAI, based on Pavela's framework.

Preventing and coping with violations of academic integrity

In order to prevent and successfully cope with VAI, research emphasizes the importance of the following characteristics: (1) clear institutional policy and punishment, (2) improvement of teaching and evaluation practices, and (3) strengthening of ethical standards among students and faculty (Gilmore et al. 2016). Enforcement and *punishment* is obtained by formulating strict rules relating to what is permitted and what is forbidden, enforcing these rules, and punishing those who break the rules (for a review, see: Murdock and Anderman 2006). According to this approach, when the chance of being caught for VAI is high and when students are aware of the seriousness of the punishment for VAI, they are less likely to choose to engage in VAI (Graham et al. 1994). Thus, students' perceptions of the severity of penalties for VAI may influence their likelihood of engaging in VAI (Brimble 2016).

Other studies highlight the importance of strengthening students' *ethical beliefs* and of teaching ethics in higher education (e.g., Christensen Hughes and Bertram Gallant 2016). Consistent with this claim, Blau and Eshet-Alkalai (2016) found that school students' ethical beliefs explained an additional 13% of the variance in digital VAI, after controlling for a variety of sociodemographic variables. Moreover, ethical beliefs mediated the effect of intrinsic motivation and ethnicity on VAI. Namely, adding students' ethical beliefs to the analysis neutralized the advantage of students with high intrinsic motivation, who otherwise engaged in less VAI than students with low levels of motivation. Similarly, adding ethical beliefs to the regression analysis mediated the disadvantage of ethnic minority students who otherwise engaged in more academic offenses compared to ethnic majority students.

Other authors (e.g., Harkins and Kubik 2010) suggest that it may be important to revise standards of what is considered ethical and unethical. Namely, Harkins and Kubik argued that in the context of learning in modern digital environments, current notions of VAI are outdated, and introduced the term "*ethical cheating*". Ethical cheating acknowledges learning practices related to the exchange of information and ideas, as well as practices of helping peers in the context of collaborative learning, participation in online learning communities, and the use of open source information to construct knowledge as acceptable behaviors and an integral part of the learning process. Acknowledging acceptable learning practices and differentiating them from VAI is especially important in light of the literature review suggesting that some VAI are perceived by students as "not cheating" and therefore, when students engage in these offenses, they do not think that they are doing anything 'wrong' (De Lambert et al. 2016). The authors emphasize that students should not be left with room to make legitimacy assumptions in novel areas such as the use of new technologies.

The *pedagogical approach* for dealing with VAI focuses on the important role that instructors, teaching style, and evaluation methods play, not only in treating, but also in preventing academic offenses from occurring (for review see: Brimble 2016; Davies and Howard 2016; De Lambert et al. 2016). This may include teaching students referencing skills and discussing expected academic standards (e.g., summarizing in one's own words; Davies and Howard 2016; riedman et al. 2016a). Equally important are formative or/and summative assessment strategies, such as creating

ongoing tasks and assignments that are meaningful and relevant for students (Blau and Eshet-Alkalai 2017), and even designing the criteria for grading assignments together with students (Thomas and Scott 2016). In addition to these methods of preventing academic offenses, some researchers (Bertram Gallant 2017) also suggest utilizing the moment the offense is caught as a teaching opportunity (e.g., for explaining appropriate citation rules). Similarly important in the prevention of VAI is the degree of "fairness" perceived by students in terms of the quality of teaching, availability of the instructor, content difficulty level, and the amount of time required for reading and preparing learning assignments (Brimble and Stevenson-Clarke 2006). Respondents of several studies (for review see: De Lambert et al. 2016) indicated that their main reasons for engaging in VAI were fear of failing and the course workload being too high.

Factors associated with VAI: Neutralizing effects and sociodemographic variables

Studies revealed a range of variables, which may be associated with VAI, including neutralizing effects, institutional identification, and sociodemographic variables (for review see Brimble 2016). In relation to perceptions of fairness, Brimble discusses *a neutralizing effect* in which, although students believe that their behavior was wrong, they deny it or/and blame external factors or people for it. Such external factors may reflect a cost–benefit analysis of financial investment in education, "fair and equal opportunity to succeed" (Owunwanne et al. 2010), or being an international student and thus, not native in the language in which teaching, learning and evaluation are conducted (Brimble 2016). Interestingly, *from an institutional perspective*, regardless of academic success, students who did not have a strong sense of identification with their institution had a stronger tendency towards VAI than those students who had a strong affiliation (De Lambert et al. 2016). Thus, low levels of identification with the academic institution may have a neutralizing effect on students' integrity.

The neutralizing effect is consistent with the Self-Concept Maintenance Model (Mazar et al. 2008). This model, which was suggested within the approach of behavioral ethics and was not aimed at explaining violations of *academic* integrity specifically (but rather violations of integrity in general), can also successfully explain VAI in educational settings (e.g., Friedman et al. 2016a). The model argues that the key psychological factor which enables individuals to engage in VAI is the ability to maintain one's self-image as an honest person, despite VAI. Although the neutralizing effect does not impact the decision to engage in academic offenses, students use external factors *after* engaging in the offenses for the same reason suggested by Mazar and colleagues—to protect and maintain the self-image of an honest person.

Various sociodemographic variables may produce neutralizing effects in relation to the VAI phenomenon, including gender, ethnic origin, and seniority in studies. Regarding *gender*, previous research has shown (Blau and Eshet-Alkalai 2014) that regardless of age, VAI was more prevalent and perceived as more acceptable by male school students compared to female students. On the other hand, Friedman et al. (2016a) reported the disciplinary committee imposing significantly more severe penalties on women than men and this finding was recently replicated by

Etgar et al. (2019). This gender gap could not be explained by the different VAI behavior of female students, the reason for engaging in unethical behavior as explained by students, or their unwillingness to cooperate after being caught. Since the disciplinary committee protocols were publicly available, female students could potentially become aware of such punishing inequity and it might trigger the neutralizing effect in further occurrences of VAI. Other research (e.g., Ives et al. 2017) failed to demonstrate gender differences in VAI.

Regarding the *students' origin*, a number of studies have supported the neutralizing effect. For example, in a study conducted at the University of Minnesota, 85% of all reported cases of VAI were conducted by non-native English speakers (Marshall and Garry 2006). Similarly, ethnic minority students studying in Arabic-speaking schools reported significantly higher levels of VAI in classrooms compared to ethnic majority students in Hebrew-speaking schools (Blau and Eshet-Alkalai 2016). Moreover, Kremmer et al. (2007) found that compared to domestic students, international students were more likely to cheat on exams, but were less likely to self-report cheating. Non-native speakers or ethnic minority students may feel under greater pressure to compete, and consequently be tempted to a greater extent than others to "make the grade" (Gilmore et al. 2016).

Regarding students' age, in contrast with pupils who engage in more VAI in high-school compared to elementary and middle-school (Sidi et al. 2019), in higher education the variables such as *academic degree* and *year in college* were not associated with excuses related to VAI behaviors, such as lacking academic experience and enculturation into one's discipline. Namely, a previous study (Sheard et al. 2003) failed to detect differences in the academic offenses of undergraduate versus graduate students and of junior versus senior college students.

Research goals and questions

As mentioned above, there is a gap in the literature in relation to the comprehensive comparison of different VAI types conducted in analog versus digital settings, in order to distinguish between the main effect of technology in this phenomenon and its interaction with offense type (Blau and Eshet-Alkalai 2017; Sidi et al. 2019). In addition, previous studies mostly focus on *either* the perspective of instructors *or* of students, and there is a shortage of *comparisons* between the perspectives of different stakeholders, such as students and faculty members, in relation to the same phenomenon—regarding different types of VAI and the penalties for these types of misconduct (e.g., Blau et al. 2017). Moreover, previous studies (Gilmore et al. 2016; Kremmer et al. 2007; Sheard et al. 2003) did not systematically explore whether sociodemographic characteristics of students, such as gender, ethnic origin, and seniority in studies, may produce neutralizing effects (Mazar et al. 2008) in relation to the VAI phenomenon.

This study compares perceptions of students and faculty members regarding different types of VAI engaged in by students. This was done whilst comparing digital and analog VAI, as well as the perceived severity of penalties imposed for engaging in different types of analog and digital VAI as defined by Pavela's (1997)

comprehensive conceptual framework. Furthermore, this study examines whether such perceptions vary according to students' sociodemographic characteristics such as ethnicity, gender and academic degree, in order to reveal additional variables, which may influence perceptions of VAI. The between-subjects factor was the study group (faculty members, Hebrew-speaking students, and Arabic-speaking students) and the within-subjects factor was digital versus analog VAI. The study explored the following research questions:

1. Do *students and faculty* members have different perceptions regarding the severity of *penalties imposed by the university disciplinary committee*?
2. *Among students*, are there differences in perceptions regarding the severity of penalties imposed by the university disciplinary committee according to sociodemographic variables (ethnicity, gender, and degree)?
3. Do *students and faculty* members have different perceptions regarding the severity of different analog and digital VAI engaged in by students (cheating, plagiarism, fabrication, and facilitation) *and suggested penalties* for these types of violations?
4. *Among students*, are there differences in perceptions regarding the severity of different analog and digital VAI engaged in by students (cheating, plagiarism, fabrication, and facilitation) and suggested penalties for these types of violations according to sociodemographic variables (ethnicity, gender, and degree)?

Method

To answer the research questions, this study employed an online survey method. In addition to the advantages of survey in general, such as high capability in representing a large population and no observer subjectivity, online data gathering makes it possible to ensure the participants' anonymity, which is important for such a sensitive topic as VAI. To deal with disadvantages of surveys in general and online surveys in particular, which are not ideal for controversial issues and eliminate the inappropriateness of questions, we piloted the instruments in face-to-face, non-self-selected sample and compared the patterns with the main online self-selected sample.

Participants

The main sample consisted of 1482 students studying in a large Israeli university, 1300 (87.7%) of whom were a Hebrew-speaking ethnic majority and 182 (12.3%) of whom were an Arabic-speaking ethnic minority. The sample was gender-balanced: 704 (49.3%) of the participants were male and 724 (50.7%) were female. The participants' ages ranged between 13 and 90, which represents the age range of the student population at the university, with a mean age of 32.6 (SD 10.8). In terms of students' field of study, 215 (14.5%) of the students were studying humanities, 722 (48.7%) social sciences, 158 (10.7%) life sciences, and 308 (20.8%) other subjects. Since we could not find either reports in the literature or systematic differences in

our data regarding the dependent variables as a function of students' field of study, we do not address this factor as an additional independent variable. In relation to the students' degree, 1147 (77.4%) of the participants were undergraduate students and 159 (10.7%) were graduate students. Although the university in which the study was conducted is a distance education institution, most of the courses are blended, rather than completely online and the vast majority of the learning materials are still printed. While most of the assessment and seminar work are digitally prepared and submitted, almost all of the final exams are conducted in an analog environment. That is to say, while much of the learning and course work are conducted online, exams are attended at university centers across the country and hand-written.

In addition, the sample included a comparison group of 42 faculty members from the same university. Among them 26 (61.9%) were male and 16 (38.1%) were female. The faculty members' age ranged between 35 and 68, with an average of 50.69 (SD 8.68). Faculty members taught in the fields of humanities, social sciences, life and natural sciences, and exact sciences (including computer science).

Instruments

1. To answer research questions 1 and 2, the following measure was used to assess *the perceived severity of penalties imposed by the university disciplinary committee.* Students and lecturers were asked to rank the severity of actual penalties taken from the committee regulations and imposed by the university disciplinary committee among students who conduct VAI. The instrument (see Appendix) was piloted in a previous study (Blau et al. 2017). Each punishment was rated on a scale from 1 'a very lenient punishment' to 6 'a very severe punishment'. Penalties (see Appendix) were categorized into four types: (1) *reprimanding for behavior*—1 item (Q1); (2) *financial penalties*—4 items, α=0.67 (Q2–Q5); (3) *academic penalties*—7 items, α=0.81 (Q6–Q11, Q16); and (4) *accessibility penalties*—4 items, α=0.84 (Q12–Q15). The categories were based on the face validity of the items revised by four experts in the field. Mean severity scores were calculated for each category.

2. To answer research questions 3 and 4, the following measure was used to assess *the perceived severity of violations of academic integrity by students*—students and lecturers were presented with a series of scenarios of students' VAI (adapted from Blau and Eshet-Alkalai 2017). The scenarios were based on descriptions of actual incidents of VAI from the disciplinary committee protocols and corresponded with the 4 types of VAI depicted in Pavela's conceptual model (1997). A total of 24 incidents of VAI were presented, representing each of the 4 types of VAI, in analog and digital settings, for each of the 3 types of assessment in the university (exam, assignment and paper). An example of an analog violation is copying a seminar paper from an example paper found in the library. An example of a digital violation is copying a seminar paper from an example paper found on the course website. The students and lecturers were asked to rank the severity of the violation in each scenario on a scale from 1 'a very minor violation' to 6 'a very severe violation'. Mean severity scores were calculated for scenarios

representing each of the following types of VAI: analog cheating, digital cheating, analog plagiarism, digital plagiarism, analog fabrication, digital fabrication, analog facilitation, and digital facilitation.

3. To answer research questions 3 and 4, the following measure was used to assess *suggested penalties for* VAI. For each of the scenarios described above, students and lecturers were asked to choose an appropriate punishment taken from the committee regulations and described above, ranging from 0 'acquittal' to 16 'permanent expulsion', the most severe punishment (Friedman et al. 2016a). The suggested penalties, ranging in score from 0 to 16, in accordance with their increasing severity, can be found in "Appendix". Mean punishment scores were calculated for scenarios representing each of the following types of VAI: analog cheating, digital cheating, analog plagiarism, digital plagiarism, analog fabrication, digital fabrication, analog facilitation, and digital facilitation.

4. To answer research questions 2 & 3, participants were asked to report on a number of sociodemographic variables, including ethnicity (Hebrew-speaking/Arabic-speaking/other), gender (male/female), and degree (undergraduate/graduate).

Procedure

The institutional ethics committee approved the study. The questionnaire was piloted among a sample of 70 undergraduates in psychology and education, who anonymously participated in several research laboratory experiments as a requirement for their studies. Students' and faculty members' participation in the main study was anonymous and voluntary. The organizational email, which contained a link to the online questionnaire, was sent by the researchers to all faculty members and students at the university. The academic institution is the largest university in Israel and includes approximately 100 senior faculty members, 330 teaching faculty members, and 50,000 students. The data was collected through the institutional survey system. The survey was closed after 1 week, with almost 1500 responses collected. Statistical analyses were conducted using SPSS 22.

Results

The severity of penalties imposed by the university disciplinary committee: The perceptions of students versus faculty members

In order to address research questions 1 and 2, multiple analyses of variance (MANOVA) were conducted in order to examine differences between students of different ethnicity (Arabic-speaking compared to Hebrew-speaking students) and faculty members in terms of perceptions regarding the severity of penalties imposed by the university disciplinary committee (Table 1). LSD post hoc tests were performed in order to identify the source of significant differences between the study groups.

Table 1 Comparison between students' of different ethnicity and faculty members' perceptions regarding the severity of penalties imposed by the disciplinary committee

Punishment type	M (SD)			MANOVA and LSD post hoc tests
	(1) Hebrew-speaking students	(2) Arabic-speaking students	(3) Faculty members	
Reprimanding	2.17 (1.09)	2.63 (1.53)	1.36 (0.79)	F(2,1524) = 24.58***, ES = 0.03, 2 > 1 > 3
Financial penalties	4.13 (0.95)	4.15 (1.13)	3.30 (0.74)	F(2,1524) = 15.19***, ES = 0.02, 1,2 > 3
Academic penalties	4.08 (1.09)	4.23 (1.07)	3.19 (1.18)	F(2,1524) = 15.74***, ES = 0.02, 1,2 > 3
Accessibility penalties	4.98 (0.71)	5.01 (0.97)	4.28 (0.85)	F(2,1524) = 18.59***, ES = 0.02, 1,2 > 3

ES Effect size

*** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$. p values are adjusted for number of comparisons. Significant according to Kruskal–Wallis non-parametric test

As Table 1 shows, findings related to research question 1 (comparing students and faculty members) indicated that students perceived all four types of penalties imposed by the university disciplinary committee to be significantly more severe than faculty members. Furthermore, in relation to research question 2 concerning ethnicity differences between students, Arabic-speaking minority students were found to perceive being reprimanded as significantly more severe a punishment than Hebrew-speaking students. No additional significant differences were found between Hebrew-speaking and Arabic-speaking students.

In accordance with research question 2 (comparing students on sociodemographic variables), additional MANOVAs were conducted comparing male and female students and comparing undergraduate and graduate students in terms of perceptions regarding the severity of penalties imposed by the university disciplinary committee (Table 2).

The findings presented in Table 2 indicated that female students perceived being reprimanded, financial penalties, and academic penalties to be significantly more severe compared to male students. No significant difference was found between the groups in relation to the perceived severity of accessibility penalties. In terms of academic degree, findings indicated that the only significant difference between undergraduate and graduate students was in the perceived severity of financial penalties. Namely, undergraduate students perceived financial penalties to be more severe compared to graduate students.

Violations of academic integrity and penalties: The role of violation type and technology

After reporting the severity of penalties imposed by the disciplinary committee, students of different ethnicity (Arabic-speaking vs. Hebrew-speaking) and faculty members were asked to judge the severity of different types of VAI and to suggest appropriate *punishment* for such behaviors. To examine research questions 3 and 4 exploring differences in perceptions between the study groups (faculty and students, and students of different ethnic groups) regarding the severity of each type of VAI (cheating, plagiarism, fabrication, and facilitation) and suggested penalties for these behaviors, repeated measures ANOVAs were conducted. The between-subjects factor was the study group (faculty members, Hebrew-speaking students, and Arabic-speaking students) and the within-subjects factor was digital versus analog VAI. LSD post hoc tests were performed in order to identify the source of significant differences between the study groups. Table 3 presents the findings of these analyses.

In relation to research question 3 (comparing students and faculty members), a significant main effect was found for the study group. Namely, LSD post hoc tests indicated that faculty members perceived cheating, plagiarism, and fabrication to be significantly more severe compared to students. Similarly, in relation to research question 4 regarding students' ethnicity, faculty members perceived facilitation to be more severe than Hebrew-speaking students. However, no significant difference was found in perceptions regarding the severity of engaging in facilitation between Arabic-speaking students and faculty members. Furthermore, as presented above

Table 2 Comparison between students' perceptions regarding the severity of penalties imposed by the disciplinary committee according to gender, and degree

Punishment type	Degree			Gender		
	M (SD)		Comparison	M (SD)		Comparison
	Undergraduate	Graduate		Male	Female	
Reprimanding	2.20 (1.11)	2.14 (1.19)	$F(1,1265)=0.25$, ES = 0.00	2.08 (1.12)	2.28 (1.12)	$F(1,1265)=11.22$***, ES = 0.01
Financial penalties	4.15 (0.95)	3.86 (0.97)	$F(1,1265)=11.94$***, ES = 0.01	4.02 (0.97)	4.21 (0.94)	$F(1,1265)=15.27$***, ES = 0.01
Academic penalties	4.09 (1.06)	3.94 (1.15)	$F(1,1265)=2.34$, ES = 0.00	4.02 (1.07)	4.12 (1.06)	$F(1,1265)=7.40$**, ES = 0.01
Accessibility penalties	4.97 (0.75)	4.96 (0.67)	$F(1,1265)=0.01$, ES = 0.00	4.96 (0.72)	4.97 (0.75)	$F(1,1265)=1.34$, ES = 0.00

ES Effect size

***$p \leq .001$, **$p \leq .01$, *$p \leq .05$, p values are adjusted for number of comparisons. Significant according to Kruskal–Wallis non-parametric test

Table 3 Comparing students' of different ethnicity and faculty members' perceptions regarding the severity of analog and digital VAI

Severity of VAI	M (SD)			ANOVA and LSD post hoc tests
	(1) Hebrew-speaking students	(2) Arabic-speaking students	(3) Faculty members	
Analog cheating	3.31 (0.94)	3.43 (1.09)	3.87 (0.88)	**Group:** F(2,1521) = 12.20***, ES = 0.02, **3 > 2 > 1**
Digital cheating	3.25 (0.82)	3.45 (0.96)	3.84 (0.91)	Medium: F(1,1521) = 0.27, ES = 0.00
				Group*medium: F(2,1521) = 1.31, ES = 0.00
Analog plagiarism	2.47 (0.98)	2.87 (1.14)	3.53 (1.09)	**Group:** F(2,1521) = 40.64***, ES = 0.05, **3 > 2 > 1**
Digital plagiarism	2.38 (1.00)	2.85 (1.17)	3.54 (1.14)	Medium: F(1,1521) = 0.89, ES = 0.00
				Group*medium: F(2,1521) = 1.52, ES = 0.00
Analog fabrication	2.71 (1.05)	2.81 (1.07)	3.50 (1.25)	**Group:** F(2,1521) = 13.20***, ES = 0.02, **3 > 1, 2**
Digital fabrication	3.01 (1.06)	3.13 (1.13)	3.82 (1.17)	**Medium:** F(1,1521) = 70.86*** , ES = 0.05, **Digital > Analog**
				Group*medium: F(2,1521) = 0.10, ES = 0.00
Analog facilitation	3.61 (0.99)	3.91 (1.08)	3.97 (1.20)	**Group:** F(2,1521) = 10.64***, ES = 0.01, **2,3 > 1**
Digital facilitation	3.39 (0.98)	3.68 (1.07)	3.87 (1.15)	**Medium:** F(1,1521) = 29.83*** , ES = 0.02, **Analog > digital**
				Group*medium: F(2,1521) = 0.87, ES = 0.00

Statistically significant effects are presented in bold

***$p \leq .001$, **$p \leq .01$, *$p \leq .05$, significant according to Kruskal–Wallis non-parametric. Significant results remain significant after conducting Bonferonni adjustments for multiple comparisons

in Table 3, significant differences were found between Hebrew- and Arabic-speaking students' perceptions of the severity of cheating, plagiarism, and facilitation. Namely, Arabic-speaking students perceived cheating, plagiarism and facilitation to be more severe than Hebrew-speaking students. The use of technology was found to have a significant within-subjects effect on the perception of the severity of fabrication and facilitation. Namely, while digital fabrication was perceived to be significantly more severe compared to analog fabrication, digital facilitation was perceived to be significantly less severe compared to analog facilitation. No significant interaction was found between the study group and the use of technology in VAI in perceptions regarding the severity of VAI.

Similarly, repeated measures ANOVAs in Table 4 show that the between-subjects factor, study group, had a significant main effect on suggested penalties for VAI.

In relation to research question 3 (comparing students and faculty members), and in accordance with the previously presented finding regarding more severe perceptions of VAI among faculty members compared to students, findings in Table 4 indicate that faculty members suggested significantly more severe penalties for cheating, plagiarism, fabrication, and facilitation compared to students. In relation to research question 4 regarding ethnicity, no significant differences were found between the suggested penalties for the different types of VAI suggested by Arabic- and Hebrew-speaking students, with the exception of plagiarism. Namely, Arabic speaking students suggested more severe penalties for plagiarism in comparison with Hebrew-speaking students.

In addition, Table 4 shows that the within-subjects factor, *use of technology* in VAI, was found to have a significant main effect on the suggested punishment for VAI. Interestingly, the penalties suggested for analog cheating, fabrication, and facilitation were significantly more severe compared to those suggested for digital cheating, fabrication, and facilitation. No significant interaction was found between the study group and use of technology in VAI in relation to suggested penalties for such behaviors.

In relation to research question 4 regarding *gender* differences among students and differences between *undergraduate and graduate* students, additional MANOVAs were conducted comparing male and female students and comparing undergraduate and graduate students in terms of their perceptions regarding the severity and suggested penalties for digital and analog VAI (cheating, plagiarism, fabrication, and facilitation).

As can be seen in Table 5, significant *gender differences* were found regarding the severity of plagiarism and fabrication. Namely, female students perceived plagiarism and fabrication, both analog and digital, to be significantly more severe violations than male students.

Furthermore, significant differences were found between *undergraduate and graduate* students' perceptions of VAI in relation to digital fabrication and analog and digital facilitation. Whereas digital fabrication was considered to be more severe by graduate students, both analog and digital facilitation were considered to be more severe by undergraduate students.

Although the findings above showed no significant *gender differences* in students' perceptions of cheating and facilitation, Table 6 shows that male students suggested

Table 4 Between and within-subjects effects of comparing students of different ethnicity and faculty members' *suggested penalties* for VAI

VAI type	M (SD)			ANOVA and LSD post hoc tests
	(1) Hebrew-speaking students	(2) Arabic-speaking students	(3) Faculty members	
Analog cheating	5.91 (2.79)	5.73 (3.03)	7.04 (3.13)	**Group:** F(2,1521)=4.48***, ES=0.00, **3 > 1,2**
Digital cheating	5.33 (2.32)	5.48 (2.75)	6.41 (3.15)	**Medium:** F(1,1521)=13.68***, ES=0.00, **Analog > Digital**
				Group*medium: F(2,1521)=1.77, ES=0.00
Analog plagiarism	3.08 (2.94)	3.74 (3.30)	5.63 (3.96)	**Group:** F(2,1521)=25.39***, ES=0.02, **3 > 2 > 1**
Digital plagiarism	2.86 (3.00)	3.77 (3.53)	6.07 (3.99)	Medium: F(1,1521)=0.48, ES=0.00
				Group*medium: F(2,1521)=2.73, ES=0.00
Analog fabrication	4.37 (3.41)	4.40 (3.24)	7.06 (3.82)	**Group:** F(2,1521)=11.46***, ES=0.02, **3 > 1,2**
Digital fabrication	5.29 (3.62)	5.14 (3.67)	7.49 (3.84)	**Medium:** F(1,1521)=22.38***, ES=0.01, **Analog > Digital**
				Group*medium: F(2,1521)=1.03, ES=0.00
Analog facilitation	6.23 (3.03)	6.60 (3.17)	7.37 (3.94)	**Group:** F(2,1521)=7.78***, ES=0.01, **3 > 1,2**
Digital facilitation	5.61 (3.00)	5.88 (2.95)	7.22 (3.56)	**Medium:** F(1,1521)=0.78, ES=0.00
				Group*medium: F(2,1521)=1.41, ES=0.00

Statistically significant effects are presented in bold

ES effect size

***p ≤ .001, **p ≤ .01, *p ≤ .05, significant according to Kruskal–Wallis non-parametric. Significant results remain significant after conducting Bonferonni adjustments for multiple comparisons

Table 5 Comparison of students' perceptions regarding the severity of analog and digital VAI as a function of gender and academic degree

Severity	Degree			Gender		
	M (SD)		Comparison	M (SD)		Comparison
	Undergraduate	Graduate		Male	Female	
Analog cheating	3.28 (0.95)	3.27 (0.91)	$F_{(1,1265)} = 0.01$, ES = 0.00	3.23 (0.96)	3.33 (0.92)	$F_{(1,1265)} = 1.44$, ES = 0.00
Digital cheating	3.26 (0.82)	3.17 (0.87)	$F_{(1,1265)} = 1.38$, ES = 0.00	3.20 (0.83)	3.29 (0.81)	$F_{(1,1265)} = 1.44$, ES = 0.00
Analog plagiarism	2.46 (0.98)	2.55 (1.04)	$F_{(1,1265)} = 1.33$, ES = 0.00	2.32 (1.00)	2.61 (0.95)	$F_{(1,1265)} = 18.86^{***}$, ES = 0.02
Digital plagiarism	2.39 (1.00)	2.36 (1.06)	$F_{(1,1265)} = 0.02$, ES = 0.00	2.25 (1.01)	2.51 (0.98)	$F_{(1,1265)} = 15.01^{***}$, ES = 0.01
Analog fabrication	2.66 (1.04)	2.81 (1.04)	$F_{(1,1265)} = 2.88$, ES = 0.00	2.55 (1.09)	2.80 (1.00)	$F_{(1,1265)} = 12.76^{***}$, ES = 0.01
Digital fabrication	2.97 (1.07)	3.15 (1.07)	$F_{(1,1265)} = 4.32^{*}$, ES = 0.00	2.89 (1.10)	3.08 (1.03)	$F_{(1,1265)} = 7.39^{**}$, ES = 0.01
Analog facilitation	3.65 (0.99)	3.33 (0.98)	$F_{(1,1265)} = 12.92^{***}$, ES = 0.01	3.53 (1.01)	3.68 (0.98)	$F_{(1,1265)} = 1.30$, ES = 0.00
Digital facilitation	3.43 (0.97)	3.14 (0.97)	$F_{(1,1265)} = 12.03^{***}$, ES = 0.01	3.36 (1.00)	3.43 (0.95)	$F_{(1,1265)} = 0.44$, ES = 0.00

ES effect size

$^{***}p \leq 0.001$, $^{**}p \leq 0.01$, $^{*}p \leq 0.05$, significant according to Kruskal–Wallis non-parametric. *p* values are adjusted for number of comparisons

Table 6 Comparison between undergraduate and graduate students and male–female students' *suggested penalties* for analog and digital VAI

Suggested punishment for:	Degree			Gender		
	M (SD)		Comparison	M (SD)		Comparison
	Undergraduate	Graduate		Male	Female	
Analog cheating	5.92 (2.85)	6.13 (2.66)	$F_{(1,1265)} = 0.65$, ES = 0.00	6.07 (2.97)	5.82 (2.69)	$F_{(1,1265)} = 4.40^*$, ES = 0.00
Digital cheating	5.41 (2.36)	5.33 (2.50)	$F_{(1,1265)} = 0.17$, ES = 0.00	5.51 (2.55)	5.30 (2.21)	$F_{(1,1265)} = 1.43$, ES = 0.01
Analog plagiarism	3.18 (3.06)	3.29 (2.83)	$F_{(1,1265)} = 0.23$, ES = 0.00	3.02 (3.04)	3.34 (3.03)	$F_{(1,1265)} = 2.61$, ES = 0.00
Digital plagiarism	2.95 (3.11)	2.96 (3.01)	$F_{(1,1265)} = 0.01$, ES = 0.00	2.76 (3.14)	3.13 (3.05)	$F_{(1,1265)} = 1.73$, ES = 0.00
Analog fabrication	4.39 (3.48)	4.54 (3.40)	$F_{(1,1265)} = 0.39$, ES = 0.00	4.11 (3.42)	4.67 (3.39)	$F_{(1,1265)} = 6.84^{**}$, ES = 0.00
Digital fabrication	5.28 (3.67)	5.75 (3.68)	$F_{(1,1265)} = 2.33$, ES = 0.00	5.25 (3.77)	5.41 (3.58)	$F_{(1,1265)} = 0.98$, ES = 0.00
Analog facilitation	6.41 (3.08)	5.77 (2.85)	$F_{(1,1265)} = 5.97^*$, ES = 0.00	6.32 (3.09)	6.35 (3.04)	$F_{(1,1265)} = 0.68$, ES = 0.01
Digital facilitation	5.77 (3.01)	5.03 (2.68)	$F_{(1,1265)} = 8.34^{**}$, ES = 0.00	5.73 (3.05)	5.63 (2.92)	$F_{(1,1265)} = 1.18$, ES = 0.00

ES effect size

$^{***}p \leq 0.001$, $^{**}p \leq 0.01$, $^*p \leq 0.05$, significant according to Kruskal–Wallis. p values are adjusted for number of comparisons

more severe penalties for analog cheating, whereas female students suggested more severe penalties for analog fabrication.

In addition, significant difference was found between the penalties suggested by *undergraduate and graduates* for analog and digital facilitation. Namely, undergraduate students suggested more severe penalties for both analog and digital facilitation compared to graduate students.

Discussion

This chapter first discusses the severity of penalties imposed by a disciplinary committee and addresses differences between students and faculty, as well as differences between students as a function of their socio-demographic variables. Following that, the chapter discusses severity of academic offenses and penalties in analog versus digital settings, by comparing the perspectives of students and faculty in relation to this phenomenon and by exploring differences between students based on their socio-demographics.

Differences between students and faculty in perceptions of the severity of penalties

The first research question explored differences between students and faculty members concerning their perceptions of the severity of penalties imposed by a university disciplinary committee. Findings show a clear difference between students and faculty members concerning their perceptions of the severity of penalties for VAI. Namely, students perceived all four types of penalties (reprimanding, financial, academic, and accessibility) to be significantly more severe than faculty members. The severe attitude towards VAI by faculty members in this study is consistent with findings reported by Peled et al. (2012) from a comparative large-scale study conducted on faculty members in the US, Israel, and Germany. In that study, approximately 75% of the faculty members perceived students' VAI as a problem in their department, and were personally involved in handling such violations in their institution. Among students, previous findings (Brimble 2016; Murdock and Anderman 2006) indicate that students' perception of the severity of penalties for VAI may influence their likelihood of engaging in such offenses. This seems to indicate the importance of continuing to impose penalties that are perceived to be appropriately severe by faculty members, despite students' perceptions of these penalties as being "too severe" in our study.

Differences in the severity of penalties as a function of students' socio-demographics

The second research question explored differences between students regarding the perceived severity of penalties, according to socio-demographic variables (ethnicity, gender, and academic degree). Apart from being reprimanded, which was perceived

as significantly more severe by ethnic minority students, no additional differences were found between ethnic minority and majority students (Table 1). The difference in perceptions of the severity of being reprimanded, which was found between ethnic majority and minority students in higher education, is consistent with Blau and Eshet-Alkalai's (2016) findings among school students from elementary and secondary schools, and could possibly reflect cultural diversity concerning reprimanding. Interestingly, adding the variable "ethical beliefs" to the analysis conducted in a previous study mediated the disadvantage of ethnic minority students, who were otherwise found to engage in more VAI than ethnic majority students. Nonetheless, the findings regarding the particular ethnic minority examined in this study may not be generalizable to ethnic minorities in other countries. Unlike the Hispanic population in the US, the Arabic-speaking minority students in this study are not immigrants who study the country's official language as a foreign language, but rather an Israel-born ethnic minority, speaking the country's second official language (Arabic), similar to the French-speaking population of Canadian Quebec. However, unlike the French-speaking population of Canadian Quebec, Arabic-speakers in Israel do not live in a discrete territory, but rather, are spread in geographically dispersed villages and towns. In contrast to Arabic-speaking minorities in Europe, the minority students in this study finished Arabic-speaking schools, but have chosen to continue studying in a Hebrew-teaching university. Thus, their language-related issues are similar to immigrants and international students around the world and can provoke VAI.

Concerning *gender* differences (Table 2), findings revealed that female students perceived being reprimanded, financial penalties, and academic penalties to be significantly more severe compared to male students. In contrast, no significant gender difference was found for the perceived severity of accessibility penalties. It seems that although male students have been found to engage in VAI to a greater extent in higher education (for review see: Brimble 2016; De Lambert et al. 2016) and in schools (Blau and Eshet-Alkalai 2016), female students tend to feel more shame than males for behaving unethically (Tibbetts 1999). Our finding apparently contradict recent reports on the actual penalties imposed by disciplinary committees (Etgar et al. 2019), suggesting that female students are punished more severely than males. This tendency was found to be stable over time and could not be explained by other variables, such as the kind of offense, the reason for engaging in it, or the willingness to take responsibility for such behavior. However, the explanation based on the Shifting Standard Model (Biernat 2012) suggested by the authors is actually consistent with our findings. According to this model, people from stereotyped groups (e.g., women) are being judged in comparison to their own group's standards, and not in relation to general standards. Accordingly, women are expected to hold higher moral standards (Reichel et al. 2010) and be more honest and loyal (Kahn 2017) than men. Consequently, their immoral behavior is perceived as more problematic—by themselves in our research and by the disciplinary committee members in a previous study (Etgar et al. 2019).

Concerning the students' *academic degree*, the only significant difference between undergraduate and graduate students was found in relation to the perceived severity of financial penalties. As expected, undergraduates, who are often

financially-dependent, perceived financial penalties as more severe than graduate students, who are on average more financially independent. The absence of differences in other comparisons related to academic degree is consistent with a previous study (Sheard et al. 2003), which did not detect differences in academic offenses between undergraduates and graduate students.

Severity of analog versus digital VAI: differences between students and faculty

The third research question explored differences between students' and faculty members' perceptions regarding the severity of different analog and digital VAI (cheating, plagiarism, fabrication, and facilitation) engaged in by students, and the suggested penalties for these types of misconduct. The findings (Table 3) indicated that faculty members perceived the offenses of cheating, plagiarism, and fabrication to be significantly more severe compared to students. In addition, facilitation was perceived to be more severe by majority students, but not by minority students. Similarly, compared to students, faculty members suggested significantly more severe penalties for all types of VAI (Table 4). These findings indicate a significant gap in the perception of the same offenses' severity and penalty as a function of position in the academic institution—faculty versus students. These findings are consistent with an analysis of VAI among students in a large Israeli university as reflected in the protocols of the disciplinary committee (Friedman et al. 2016a). The analysis indicated that the majority of students who were tried for engaging in VAI claimed that they had acted innocently, believing that what they had done was acceptable.

Regarding the effect of *the use of technology*, digital fabrication was found to be perceived significantly more severely compared to analog fabrication, while digital facilitation was perceived significantly less severely compared to analog facilitation. Interestingly, the penalties suggested for almost all analog offenses—cheating, fabrication, and facilitation—were significantly more severe compared to those suggested for similar digital offenses. However, no significant interaction effect was found between the study groups and use of technology in relation to perceptions regarding the severity of VAI or penalties for such behaviors. Findings suggest that, regardless of their position in the university, both faculty members and students tend to penalize analog offenses more severely than digital ones, even when they perceived the digital offense itself as being more severe, as in the case of digital facilitation. A possible explanation for these findings is that faculty members might be not be sufficiently aware of the potential of digital technologies in promoting practices such as cut-and-paste and unauthorized peer-to-peer sharing (Rogerson and Basanta 2016; Sutherland-Smith 2016) or the availability of websites that sell academic papers and offer "contract cheating" (Newton and Lang 2016; O'Connor 2003). The university students' perceptions in our study are consistent with findings from school students, indicating that digital plagiarism and facilitation are perceived as being more acceptable than analog plagiarism and facilitation (Blau and Eshet-Alkalai 2014, 2017). In addition, there are indications (Lathrop and Foss 2000) that the more advanced the technology is in its facilitation of copying, editing and information dissemination, the lower the integrity standards of students and their ability to cope with temptation

to act unethically. Thus, it seems that the use of technology poses dual ethical challenges to academic institutions. On the one hand, academic institutions should raise faculty members' awareness regarding the role of technology in engagement in VAI. On the other hand, academic institutions are faced with raising students' understanding that digital VAI are equally unacceptable and will be penalized as severely as analog offenses. From a pedagogical perspective regarding the phenomenon of digital VAI, consistent with the concept of "ethical cheating" (Harkins and Kubik 2010), it is important to teach students acceptable ways of incorporating digital sources in their writing (De Lambert et al. 2016), as well as proper dissemination of information in collaborative digital learning environments and social networks.

Severity of analog versus digital VAI: The role of students' socio-demographics

The last research question explored the differences in students' perception regarding the severity of different analog and digital VAI (cheating, plagiarism, fabrication, and facilitation) engaged in by students, as well as suggested penalties for these types of misconduct according to sociodemographic variables (ethnicity, gender, and degree). Regarding the role of *ethnicity* (Table 3), the findings revealed that minority students perceived cheating, plagiarism and facilitation offenses to be more severe compared to majority students. This finding is consistent with a previous comparison of majority and minority students' perceptions regarding different types of VAI (Blau et al. 2017). However, no significant differences related to ethnicity were found between the penalties (Table 4) for the different types of VAI suggested by students. The only exception was plagiarism, for which the minority students suggested more severe penalties than the majority students. On the one hand, feeling more pressure to compete might lead ethnic minority students to be more tempted to conduct VAI (Gilmore et al. 2016). Indeed, those who are non-native speakers may tend to use more cut-and paste techniques instead of re-phrasing and original writing (Brimble 2016; Rotem et al. 2016). On the other hand, their perceptions of the VAI phenomenon might reflect a neutralizing effect, in which students believe that a certain behavior is wrong and yet deny it or blame external factors for it. Such external factors may represent the cost–benefit analyses of disadvantaged students for not having "fair and equal opportunity to succeed" (Owunwanne et al. 2010), or not being native in the language in which testing or learning are conducted (Brimble 2016). This explanation according to the "neutralizing effect" in the educational literature is consistent with the Self-Concept Maintenance Model (Mazar et al. 2008) in the behavioral ethics literature. According to this model, people behave unethically up to the point at which they are able to perceive themselves as honest people. For instance, feeling disadvantaged may make unethical behavior seem more acceptable to minority students; at the same time, they may report more severe perceptions of VAI in order to maintain positive self-image. It is important to examine these issues among ethnic minorities in other countries to understand whether our findings are generalizable to other contexts.

Concerning the effect of *gender*, our findings show that female students perceived cases of plagiarism and fabrication in both analog and digital settings to be

significantly more severe than male students (Table 5). It seems that, similarly to the explanation of gender differences in VAI reported in the literature (e.g., Brimble 2016), our finding can be explained by Tibbett's finding (1999) that females tend to feel more shame than males for unethical behavior. Moreover, although no significant gender differences were found in students' perception of cheating and facilitation, male students suggested more severe penalties for analog cheating, whereas female students suggested more severe penalties for analog fabrication (Table 6). A possible explanation for this finding might be the neutralizing effect (Brimble, 2016), indicating that each gender tends to suggest more severe penalties for the offense in which s/he tends to be more involved. More research is needed to explore this possible explanation.

Regarding the impact of students' *academic degree*, digital fabrication was considered to be a more severe offense by graduate students compared to undergraduates. In contrast, both analog and digital facilitation were considered to be more severe by undergraduates compared to graduate students (Table 5). Consistent with their perception of the severity of these offenses, undergraduates suggested more severe penalties for both analog and digital facilitation compared to graduate students (Table 6). This finding is different from a previous study (Sheard et al. 2003), which did not detect differences in academic offenses between either undergraduates versus graduate students, or between junior versus senior college students. One possible explanation is a different demographic of the samples. While the current study examined students from different fields of study, Sheard et al. (2003) focused specifically on IT students. Another possible explanation is that since almost a decade and a half has passed between both studies, the difference between the findings might reflect changes in the learning culture. Our findings regarding the higher tolerance of graduate students in relation to facilitation seem to be consistent with the spreading culture of collaborative learning. This culture is particularly prevalent in smaller graduate courses, which nurture teamwork and discussions in learning communities (Blau and Shamir-Inbal 2017, 2018). As mentioned earlier, some authors even use the concept of "*ethical cheating*" (Harkins and Kubik 2010) to convey the message of acceptable peer help in digital learning communities. Regarding fabrication, graduate students conduct more advanced research projects as a part of seminar courses, final projects or theses and thus, they are more aware and less tolerant towards fabrication of data and references in their writing.

Conclusion, limitations and future directions

This study compared the perceptions of a large sample of faculty members, majority and minority students regarding the actual penalties imposed by the institutional disciplinary committee for a variety of types of VAI. The offenses included correspond with the VAI framework suggested by Pavela (1997), which was expanded to include digital learning environments. The study aimed to address the gap in the literature in the comprehensive comparison of different VAI types conducted in analog versus digital settings. Surprisingly, all participants suggested more severe penalties for VAI conducted in traditional analog environments than for the same offenses

conducted in digital settings. In addition, we compared the perspectives held by different stakeholders—students and faculty—on different types of VAI and the penalties for these types of misconduct. Students perceived all four types of penalties to be significantly more severe than faculty members and suggested more severe punishments for such VAI. Lastly, we aimed to close the existing gap in the literature by exploring whether the sociodemographic characteristics of students may produce neutralizing effects in relation to the VAI phenomenon. Consistent with the Self-Concept Maintenance Model (Mazar et al. 2008) and Neutralizing Effect (Brimble 2016), ethnic minority students estimated cheating, plagiarism and facilitation violations as more severe compared to majority students.

It should be taken into consideration that the study was conducted at one large distance university and might reflect a particular educational culture. Future studies may include replications of our findings in different types of institutions, comparisons between campus and distance universities, or comparisons between the same institution types in countries with a different educational culture, e.g., more individualistic versus more collectivistic culture. Moreover, replicating our results in a more generalizable group (e.g., immigrants, international students) would be an important research direction for future studies.

Finally, the current study's methodology did not enable a comparison between intentional and unintentional VAI according to students' perspectives, which could be an important factor. Future studies may analyze actual protocols of the disciplinary committee in order to separate and compare intentional and unintentional VAI. Moreover, although the differences found in this study were statistically significant, the effect sizes were low. These limitations emphasize the importance of conducting further studies to continue exploring the topics raised in this paper in additional academic institutions, using different methodologies.

Educational implications

Based on the findings, we recommend acknowledging acceptable learning practices related to collaboration, exchange of ideas and information, and clearly differentiating them from VAI in order to change students' perception of VAI as "not cheating" and acceptable behavior. Moreover, we recommend that faculty members promote "student voice" in their courses, i.e., actively involving students in designing their learning practices and assessment methods (Blau and Shamir-Inbal 2018). This can serve as pedagogical prevention of VAI.

In addition, our findings showed a significant difference between faculty and students in both perceptions of the severity of VAI and in relation to suggested penalties. We recommend conducting open discussions between students and faculty members in order to reach a consolidated perception of the phenomenon of VAI. At the institutional level, it may be effective to have a clear policy regarding VAI punishment and the faculty's role in this process, strengthening the ethical standards of students, and improving teaching and assessment practices in order to prevent VAI from occurring (Gilmore et al. 2016).

Moreover, all participants tended to suggest more severe penalties for VAI conducted in traditional analog environments than for the same offenses in digital settings. Neither students nor faculty members should be left with room to make legitimacy assumptions in relatively novel areas, such as technology-enhanced learning and assessment. It is therefore important to design interventions for both students and faculty in order to change their approach to digital VAI. We suggest conducting a workshop for faculty members in order to analyze scenarios of analog and digital academic offenses and explicitly clarify the expectation to deal with these situations with similar levels of severity. As for students, we suggest designing online tutorials with simulations of appropriate conduct in similar scenarios.

Lastly, it is important to cope with *the neutralizing effect* of minority students, in which although understanding that their behavior was wrong, they deny it or/and blame external factors (e.g., learning in a second language) or people/circumstances for it (e.g., questioning having a fair and equal opportunity to succeed). We recommend strengthening identification with the academic institution in order to prevent a neutralizing effect on students' integrity. To build a sense of allegiance and strengthen students' identification with an institution, it might be beneficial to promote student voice and involve students, especially minorities, in revising an institutional honor code to address issues related to technological advancements (e.g., using smart watches in exams, disseminating information via social networks).

Appendix: Academic dishonesty scenarios and penalties

Below are *penalties* for students' violations of academic integrity (taken from the university disciplinary committee regulations). *Please rank the severity of each of the penalties* according to your opinion (from 1 'a very lenient punishment' to 6 'a very severe punishment'):

1. Reprimanding
2. Cancelling a scholarship for a period of time
3. Cancelling a tuition discount for a period of time
4. Cancelling eligibility to receive academic prizes for a period of time
5. A fine of up to 7000 NIS" (approximately 2000 US $)
6. Repealing the grade achieved on the relevant assignment and requiring submission of another assignment in its place
7. Repealing the grade achieved on a seminar paper
8. Repealing the grade achieved on an exam
9. Revoking students' course privileges
10. Revoking credits achieved from completing a course
11. Expulsion for a semester or more
12. Limited use of university facilities

13. Limited use of student card
14. Confiscation of student card
15. Cancelling confirmation of student status
16. Permanent expulsion

Below are a series of *scenarios of students' violations of academic integrity* that were tried by the academic disciplinary committee. Please *rate the severity of each violation* of academic integrity engaged in by the student (on a scale from 1 'a very minor violation' to 6 'a very severe violation'), and *choose an appropriate penalty*, in your opinion, for each violation (ranging from 0 'acquittal' to 16 'permanent expulsion'—detailed above).

[Note: The scenarios of students behaviors below were randomized by the form platform. The penalties above, which were presented after each scenario to be chosen by the participants, were in the fixed order.]

1. The student fabricated statements and data on an assignment which were supposedly taken from a book s/he had read.
2. The student sent answers to another student through a text message (SMS) during an exam.
3. The student fabricated statements and data on a seminar paper, which were supposedly taken from an academic article which s/he said s/he had found on the internet.
4. On a course assignment, the student included content from the internet without citing the source or the fact that the content had been taken from a different source.
5. When answering a question on an exam with open material, the student fabricated statements and data supposedly taken from articles on the course syllabus.
6. The student asked another student in the course to help him/her solve an assignment which student were clearly expected to be prepared independently.
7. During an exam, the student passed a note with an answer to another student.
8. On an assignment, the student fabricated and included data supposedly taken from an academic article which s/he said s/he found on the internet.
9. The student gave the assignment s/he prepared to another student in the course.
10. The student sent a request to an internet forum to ask for help solving an assignment which s/he was expected to prepare on his/her own.
11. The student sent his/her assignment by email to another student in the course.
12. The student asked another student for help writing a seminar paper which s/he expected to prepare independently.
13. The student fabricated statements and data on a seminar paper, which were supposedly taken from an article s/he read in the library.
14. The student glued course notes, which are not allowed to be used in an exam, into the course textbook which was allowed to be brought to the exam.
15. On a course assignment, the student included content from a book s/he borrowed from the library without citing the source it was taken from or mentioning the fact that the content had been taken from another source.

16. During an exam without open material, the student used his/her smartphone to search for answers on the internet.
17. During an exam with open material, the student included content from an article on the course syllabus without citing the source it was taken from or mentioning the fact that the content had been taken from another source.
18. During an exam with open material (in which use of supplementary material and searching for sources on the internet was permitted), the student fabricated statements and data which were supposedly taken from the Central Bureau of Statistics website.
19. The student sent an email with the file of his/her seminar paper to another student writing a seminar paper on a similar topic.
20. On a seminar paper, the student included content taken from another student's academic work, which was accessible in the library, without citing the source it was taken from or the fact that the content had been taken from another source.
21. During an exam with open material (in which use of supplementary material and sources on the internet is permitted), the student included content taken from a digital textbook, without citing the source it was taken from or the fact that the content had been taken from another source.
22. The student sent a request to an internet forum to ask for help writing a seminar paper which s/he was supposed to prepare on his/her own.
23. The student gave his/her printed seminar paper to another student writing a seminar paper on a similar topic.
24. The student included content from an internet website on a seminar paper without citing the source it was taken from or mentioning the fact that the content had been taken from another source.

References

Akbulut, Y., Sendag, S., Birinci, G., Kilicer, K., Sahin, M. C., & Odabasi, H. F. (2008). Exploring the types and reasons of Internet-triggered academic dishonesty among Turkish undergraduate students: Development of Internet-Triggered Academic Dishonesty Scale (ITADS). *Computers & Education, 51,* 463–473.

Alroy Stein, A. (2008). Contempt for academic values in the age of the conscious and media revolution. *The Academic College of Management, 7,* 56–57.

Baratz, L., & Reinhold, R. (2008). Follow the straight path copy is not unnecessary. *Dapey Yozma Journal of Educational Initiatives, 5,* 93–109.

Bertram Gallant, T. (2017). Academic integrity as a teaching and learning issue: From theory to practice. *Theory Into Practice, 56*(2), 88–94.

Biernat, M. (2012). Stereotypes and shifting standards: Forming, communicating, and translating person impressions. *Advances in Experimental Social Psychology, 45,* 1–59.

Blau, I., & Eshet-Alkalai, Y. (2014). *School students' perception of academic dishonesty with and without digital tools: Not acceptable, but common.* Paper presented at the International Conference on Advanced Education and Management—ICAEM2014. Beijing, China.

Blau, I., & Eshet-Alkalai, Y. (2016). *How digital technologies affect academic dishonesty behavior of school students?* Paper presented at the international conference on internet studies—NETs2016. Osaka, Japan.

Blau, I., & Eshet-Alkalai, Y. (2017). The ethical dissonance in digital and non-digital learning environments: Does technology promotes cheating among middle school students? *Computers in Human Behavior, 73,* 629–637.

Blau, I., Eshet-Alkalai, Y., & Friedman, A. (2017). Close educational gap by cheating? Comparing faculty, majority and minority students' perceptions of academic dishonesty. In *Proceedings of EdMedia 2017: World Conference on Educational Media and Technology* (pp. 118–122). Washington DC, USA: Association for the Advancement of Computing in Education (AACE).

Blau, I., Eshet-Alkalai, Y., & Rotem, I. (2014). *Cheating and e-cheating: A qualitative investigation of expanding an academic dishonesty framework into digital learning settings.* Paper presented at the 8th International Technology, Education and Development conference—INTED2014. Valencia, Spain.

Blau, I., & Shamir-Inbal, T. (2017). Re-designed flipped learning model in an academic course: The role of co-creation and co-regulation. *Computers & Education, 115,* 69–81.

Blau, I., & Shamir-Inbal, T. (2018). Digital technologies for promoting "student voice" and co-creating learning experience in an academic course. *Instructional Science, 46*(2), 315–336.

Brimble, M. (2016). Why students cheat. An exploration of the motivators of student academic dishonesty in higher education. In T. Bretag (Ed.), *Handbook of academic integrity* (pp. 365–382). Singapore: SpringerNature.

Brimble, M. A., & Stevenson-Clarke, P. (2006). Managing academic dishonesty in Australian universities: Implications for teaching, learning and scholarship. *Accounting, Accountability and Performance, 12*(1), 32–63.

Carpenter, D. D., Harding, T. S., & Finelli, C. J. (2010). Using research to identify academic dishonesty deterrents among engineering undergraduates. *International Journal of Engineering Education, 26*(5), 1156–1165.

Cheshin, Y. (2006). Academic integrity in institutions of higher education in Israel. *Al Hagova, Academic Track at the College of Management, 5,* 17–19. **(in Hebrew)**.

Christensen Hughes, J., & Bertram Gallant, T. (2016). Infusing ethics and ethical decision making into the curriculum. In T. Bretag (Ed.), *Handbook of academic integrity* (pp. 1055–1073). Singapore: SpringerNature.

Davies, L. J. P., & Howard, R. M. (2016). Plagiarism and the Internet. Fears, facts, and pedagogies. In T. Bretag (Ed.), *Handbook of academic integrity* (pp. 591–606). Singapore: SpringerNature.

De Lambert, K., Ellen, N., & Taylor, L. (2016). Academic dishonesty among students in tertiary institutions: A literature review. *Waikato Journal of Education, 11*(2), 83–99.

Etgar, S., Blau, I., & Eshet-Alkalai, Y. (2019). White-collar crime in academia: Trends in digital academic dishonesty over time and their effect on penalty severity. *Computers & Education, 141,* 103621.

Fishman, T. (2016). Academic integrity as an educational concept, concern, and movement in US institutions of higher learning. In T. Bretag (Ed.), *Handbook of academic integrity* (pp. 7–21). Singapore: SpringerNature.

Friedman, A., Blau, I., & Eshet-Alkalai, Y. (2016a). Cheating and feeling honest: Committing and punishing analog versus digital academic dishonesty behaviors in higher education. *Interdisciplinary Journal of e-Skills and Lifelong Learning, 12,* 193–205.

Friedman, A., Blau, I., & Eshet-Alkalai, Y. (2016b). *How and why students cheat? The role of technology in academic dishonesty and the penalties for conducting academic dishonesty.* Paper presented at the 8th annual international conference on education and new learning technologies—EDULEARN2016. Barcelona, Spain.

Galloway, M. K. (2012). Cheating in advantaged high schools: Prevalence, justifications, and possibilities for change. *Ethics and Behavior, 22*(5), 378–399.

Gilmore, J., Maher, M., & Feldon, D. (2016). Prevalence, prevention, and pedagogical techniques: Academic integrity and ethical professional practice among STEM students. In T. Bretag (Ed.), *Handbook of academic integrity* (pp. 729–748). Singapore: SpringerNature.

Graham, M. A., Monday, J., O'Brien, K., & Steffan, S. (1994). Cheating at small colleges: An examination of student and faculty attitudes and behaviors. *Journal of College Student Development, 35,* 255–260.

Harkins, A. M., & Kubik, G. H. (2010). "Ethical" cheating in formal education. *On the Horizon, 18*(2), 138–146.

Ives, B., Alama, M., Mosora, L. C., Mosora, M., Grosu-Radulescu, L., Clinciu, A. I., et al. (2017). Patterns and predictors of academic dishonesty in Romanian university students. *Higher Education, 74*(5), 815–831.

Kahn, J. (2017). *How gender stereotypes influence the impact of state supreme court advertisements*. Doctoral dissertation, Arizona State University. Retrieved April 10, 2019, from https://search.proquest.com/docview/1902227795?pq.

Kremmer, M. L., Brimble, M. A., & Stevenson-Clarke, P. (2007). Investigating the probability of student cheating: The relevance of student characteristics, assessment items, perceptions of prevalence and history of engagement. *International Journal for Educational Integrity, 3*(2), 3–17.

Kukolja Taradi, S., Taradi, M., & Dogas, Z. (2012). Croatian medical students see academic dishonesty as an acceptable behaviour: A cross-sectional multicampus study. *Journal of Medical Ethics, 38*(6), 376–379.

Lathrop, A., & Foss, K. (2000). *Student cheating and plagiarism in the Internet era: A wake-up call*. Englewood, CO: Libraries Unlimited.

Marshall, S., & Garry, M. (2006). NESB and ESB students' attitudes and perceptions of plagiarism. *International Journal of Educational Integrity*. https://doi.org/10.21913/IJEI.v2i1.25.

Mazar, N., Amir, O., & Ariely, D. (2008). The dishonesty of honest people: A theory of self-concept maintenance. *Journal of Marketing Research, 45*(6), 633–644.

Murdock, T. B., & Anderman, E. M. (2006). Motivational perspectives on student cheating: Toward an integrated model of academic dishonesty. *Educational Psychologist, 41*(3), 129–145.

Newton, P. M., & Lang, C. (2016). Custom essay writers, freelancers, and other paid third parties. In T. Bretag (Ed.), *Handbook of academic integrity* (pp. 249–271). Singapore: SpringerNature.

Nilsson, L. E. (2016). Technology as a double edged sword: A promise yet to be fulfilled or a vehicle for cheating? In T. Bretag (Ed.), *Handbook of academic integrity* (pp. 607–623). Singapore: SpringerNature.

O'Connor, S. (2003). *Cheating and electronic plagiarism—Scope, consequences and detection*. Paper presented at the Educause Conference. Australia.

Owunwanne, D., Rustagi, N., & Dada, R. (2010). Students' perceptions of cheating and plagiarism in higher institutions. *Journal of College Teaching and Learning, 7*(11), 59–68.

Pavela, G. (1997). Applying the power of association on campus: A model code of academic integrity. *The Journal of College and University Law, 24*(1), 1–22.

Peled, Y., Barczyk, C. C., & Sarid, M. (2012). Institutional policies and faculty perceptions of student academic dishonesty. *Educational Practice and Theory, 34*(2), 61–79.

Reichel, A., Brandl, J., & Mayrhofer, W. (2010). The strongest link: Legitimacy of top management diversity, sex stereotypes and the rise of women in human resource management 1995–2004. *Management Revue, 21*(3), 332–352.

Rogerson, A. M., & Basanta, G. (2016). Peer-to-peer file sharing and academic integrity in the internet age. In T. Bretag (Ed.), *Handbook of academic integrity* (pp. 273–285). Singapore: SpringerNature.

Rotem, I., Blau, I., & Eshet-Alkalai, Y. (2016). Academic dishonesty in the digital era: Perceptions and coping strategies of school teachers and parents. In *Proceedings of global learn conference 2016* (Vol. 2016, No. 1, pp. 397–401).

Sheard, J., Markham, S., & Dick, M. (2003). Investigating differences in cheating behaviours of IT undergraduate and graduate students: The maturity and motivation factors. *Higher Education Research & Development, 22*(1), 91–108.

Sidi, Y., Blau, I., & Eshet-Alkalai, Y. (2019). How is the ethical dissonance index affected by technology, academic dishonesty type and individual differences? *British Journal of Educational Technology, 50*(6), 3300–3314.

Stephens, J. M., Young, M. F., & Calabrese, T. (2007). Does moral judgment go offline when students are online? A comparative analysis of undergraduates' beliefs and behaviors related to conventional and digital cheating. *Ethics and Behavior, 17*(3), 233–254.

Sutherland-Smith, W. (2016). Authorship, ownership, and plagiarism in the digital age. In T. Bretag (Ed.), *Handbook of academic integrity* (pp. 575–589). Singapore: SpringerNature.

Teixeira, A., & Rocha, M. (2008). Academic cheating in Spain and Portugal: an empirical explanation. *International Journal of Iberian Studies, 21,* 3–22.

Thomas, J., & Scott, J. (2016). UK perspectives of academic integrity. In T. Bretag (Ed.), *Handbook of academic integrity* (pp. 39–53). Singapore: SpringerNature.

Tibbetts, S. (1999). Difference between women and men regarding decision to commit test cheating. *Research in Higher Education, 40,* 323–342.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Ina Blau, Ph.D., is an associate professor of educational technology and cyber-psychology. She is the Head of the Research Center for Innovation in Learning Technologies and the Head of the Graduate Program in Educational Technologies and Learning Systems at the Open University of Israel. Her research interests include integration of innovative technologies in K-12 and academia; digital literacy competencies; computational thinking, visual programming and educational robotics; social aspects of e-communication; and psychological ownership in e-collaboration.

Shira Goldberg, Ph.D., is a post-doctoral fellow at the Department of Social Work at the Hebrew University of Jerusalem, Israel and a faculty member at the Department of Education & Psychology at the Open University of Israel. She has a BA in linguistics and school counseling, an MA in school counseling, and a PhD in education from Tel Aviv University. Her major research interests are processes of parental and educational socialization, psychological adjustment and maladjustment, and engagement in risky and problematic behaviors.

Adi Friedman, M.A., holds a Master degree in educational technologies and works as an ICT specialist at the Open University of Israel. Her research focuses on implications of integrating innovative technologies in academia as well as on coping with digital and analog academic dishonesty in higher education.

Yoram Eshet-Alkalai, Ph.D., is a professor at the Open University of Israel, Department of Education & Psychology. He is the founder and former Head of the Research Center for Innovation in Learning Technologies. He holds a BA in archeology (Hebrew University), MSc in geology (Hebrew University) and PhD in earth & environmental sciences (City University of New-York). He has 20 years' experience in developing technology-based instructional solutions for educational systems in Israel and the USA. In this capacity, he was involved in the design of hundreds of simulations, data-bases, tutorials and large-scale curriculum integration projects. His major research and publications interests focus on cognitive aspects of working with digital technologies, print vs. digital reading, digital literacy and academic dishonesty.

Affiliations

Ina Blau[1] ⬤ · **Shira Goldberg[1]** · **Adi Friedman[1]** · **Yoram Eshet-Alkalai[1]**

✉ Ina Blau
  inabl@openu.ac.il
  http://www.openu.ac.il/Personal_sites/ina-blau/

  Shira Goldberg
  shirago@openu.ac.il

  Adi Friedman
  adifr@openu.ac.il

  Yoram Eshet-Alkalai
  yorames@openu.ac.il
  http://www.openu.ac.il/Personal_sites/Yoram-Eshet/

[1] Department of Education and Psychology, The Open University of Israel, 1 University Road, P.O.B. 808, 43107 Ra'anana, Israel