Full length article

The ethical dissonance in digital and non-digital learning environments: Does technology promotes cheating among middle school students?

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ABSTRACT

This paper explores the rapidly-expanding phenomenon of technology-based academic dishonesty (AD). One hundred and twenty seven 7th graders received scenarios of AD, based on Pavela's (1997) framework of AD types (i.e. cheating, plagiarism, fabrication, and facilitation), in digital and non-digital settings. Participants reported on the pervasiveness of AD types in their class and on the perception of their legitimacy. The "Ethical Dissonance Index" (EDI) is calculated as the difference between the pervasiveness and the legitimacy of AD types. The ethical dissonance that learners experience when conducting academic dishonesty behaviors is expressed by the consistent findings, that the pervasiveness of all dishonesty types was significantly higher than the perception of their legitimacy. These findings indicate that students conduct AD despite its perception as unethical. In the digital setting, plagiarism is the most common type of AD, perceived as the most legitimate, and characterized by the greatest EDI. In the non-digital setting, cheating and fabrication are the most common types of AD, perceived as the most legitimate, and characterized by the greatest EDI. Educational implications and suggestions for further research are discussed.

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1. Introduction

In the era of free information, with the explosion of digital knowledge and the availability of the ubiquitous web, digital technologies enable copying, editing, and disseminating a variety of information. In digital environments learners are faced with a wide range of ethical, cultural, and behavioral challenges concerning honesty, integrity, and the fair use of content. In the reality of unlimited access to free and easy-to-copy information, learners are tempted to break the code of academic integrity and conduct academic dishonesty behaviors (McCabe, Butterfield, & Treviño, 2012; Peled, Barczyk, & Sarid, 2012). Reports from the education field indicate that in recent years we have witnessed a dramatic rise in dishonest acts among students (McCabe et al., 2012; Yekta, Lupton, Takei, Mabudi, & Jahanfar, 2013). Multiple studies documented a rapidly growing phenomenon of students' misuse of technologies for conducting academic dishonesty acts in both schools and high education (for review see: McCabe et al., 2012; McCabe & Pavela, 2004). Although digital technologies may not cause academic dishonesty, they are increasingly contributing to it (Stephens, Young, & Calabrese, 2007). Olafson, Schraw, Nadelson, Nadelson, and Kehrwald (2013) suggest that understanding the dissonance between ethical judgments and conducting unethical acts is a key issue in explaining this dishonest behavior of students.

While numerous studies investigated the attitudes, beliefs, and reasons for academic misconduct among college and university students (Donse & Groep, 2013; Stephens et al., 2007), only a few studies explored the unethical attitudes and behaviors of school students (e.g., middle school students in Ma, Wan, and Lu (2008) study and high-school students in Stephens and Nicholson's (2008) study). Moreover, there is strong evidence that indicates the limited capability of schools to cope with this expanding phenomenon (Davis, Drinan, & Gallant, 2011). In our literature search, we found a few studies (e.g. Brimble & Stevenson-Clarke, 2005; Smyth & Davis, 2004) which relate indirectly to the ethical gap in the schools' context. Surprisingly, very few studies deal explicitly

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with the ethical dissonance involved in academic dishonesty among school students (e.g., Stephens & Nicholson, 2008).

This study examines the role of technology in academic dishonesty behaviors and in shaping attitudes of Israeli school students towards this phenomenon. The research explores the built-in tension in academic dishonesty between students' dishonest behavior and their ethical values and beliefs. The research adopts the comprehensive conceptual framework for academic dishonesty types offered by Pavela (1997) and examines its need for modification today, with the predominance of digital technologies in education systems.

1.1. Academic dishonesty framework

Academic dishonesty, or the violation of academic integrity, is a non-legitimate behavior that occurs during the completion of learning activities, such as taking exams and writing papers or homework. Although academic dishonesty is definitely not a new phenomenon (for review see: McCabe, Treviño, & Butterfield, 2001), recent data indicate that the introduction of digital tools (e.g. computers, tablets, and smartphones) for legitimate learning purposes is associated with using them extensively for non-legitimate academic activities, such as exchanging answers to test-questions during exams, or reading pre-prepared summaries from smartphones during exams (Common Sense Media, 2010; Jones, 2011; Peled et al., 2012; Stuber-McEwen, Wiseley, & Hoggatt, 2009). Some authors show that students tolerate digital academic dishonesty (committed by using digital devices) more than they tolerate "traditional dishonesty" committed without the use of digital devices (e.g. Grieve & Elliott, 2013; Ma et al., 2008). However, others couldn't find any difference between digital and traditional academic dishonesty (e.g. Stephens et al., 2007).

Some studies point to the fact that many learners commit digital academic dishonesty out of naïveté and a lack of awareness of the ethical and legal problems involved in their behavior (Jones, 2011; Ma et al., 2008).

Pavela (1997) proposed a conceptual framework for academic dishonesty, which consists of the following four types of dishonest behaviors:

1. *Cheating* — using learning materials, information, or other aids, whose use was explicitly banned.
2. *Plagiarism* — use of content prepared by others and presenting it as one's own, without giving reference to the source.
3. *Fabrication* — invention or citation of non-existent information.
4. *Facilitating academic dishonesty* — intentionally helping someone else perpetrate academic dishonesty.

Pavela's framework is commonly used by studies of academic dishonesty or academic integrity. Unfortunately, most of these studies do not cover the entire scope of this phenomenon and usually address only one type of academic dishonesty [e.g. cheating (Palazzo, Lee, Warnakulasooriya, & Pritchard, 2010; Warinda & Muchenje, 2013), plagiarism (Mavrinac, Brumini, Bilić-Zulle, & Petrovečki, 2010), fabrication (Grieve & Elliott, 2013), or facilitation (Harris & Srinivasan, 2012)]. Other, more comprehensive studies investigate two types of academic dishonesty behaviors [e.g. cheating and plagiarism (Ma et al., 2008), cheating and facilitation (Smith, Derrick, & Manakyan, 2012), plagiarism and fabrication (Peled et al., 2012), or plagiarism and facilitation (Yeo, 2007)]. Very few papers explore three types of academic dishonesty, [e.g. cheating, plagiarism, and fabrication (Jordan, 2001), cheating, plagiarism, and facilitation (McCabe et al., 2012; Stone, Jawahar, & Kisamore, 2010)]. In our literature review, we found only two studies that addressed all four types of the academic

dishonesty phenomenon (McCabe, Butterfield, & Trevino, 2006; Rettinger & Jordan, 2005).

Concerning the motivation for committing academic dishonesty, Murdock and Anderman (2006) proposed a framework for organizing research literature on this phenomenon using concepts from achievement motivation research. The Academic Dishonesty Motivation (ADM) framework predicts that AD behaviors are based on three motivational mechanisms: (a) students' goals, (b) students' expectations for accomplishing those goals, and (c) students' assessments of costs associated with achieving those goals. Among others, the ADM approach predicts that students who perceive the cost associated with conducting dishonesty to be low are more likely than their peers to engage in AD behaviors. According to this framework, the cost perceived by students is not only of getting caught and punished, but also in developing a negative self-perception. Very few of previous studies explicitly compare the pervasiveness of different types of academic dishonesty (e.g., Blau & Eshet-Alkalai, 2016; Friedman, Blau, & Eshet-Alkalai, 2016a). However, based on the ADM it is reasonable to assume that all other things being equal, students who facilitate dishonesty of peers hold a more positive view of self than students engaged in cheating, plagiarism, and fabrication. Findings by Ma et al. (2008) support this explanation and suggest that facilitating academic dishonesty of others can be perceived by school students as an expression of "good friendship".

Pavela's model was proposed before the proliferation of digital communication and social network technologies and it lacks reference to the *impact of technology* on academic dishonesty. Therefore, it can be used for examining the question of technological determinism: whether digital technologies actually *determine* social behaviors and affect ethical perceptions (Nye, 2007; Smith & Marx, 1994) or they are *conduits*, *not causes* of academic dishonesty (McCabe & Stephens, 2006; Stephens et al., 2007). The fact that today, digital communication technologies are integrated in school systems and used extensively by both students and teachers, allows employing Pavela's model to compare between the perceptions of digital and non-digital academic dishonesty and to suggest strategies to cope with academic dishonesty in the digital era (Blau, Eshet-Alkalai, & Rotem, 2014).

1.2. Dishonesty in behavioral ethics: the ethical dissonance

The study of academic dishonesty is not limited to legal aspects, but also to the broader context of moral judgment and dishonesty in behavioral ethics (Bazerman & Gino, 2012). Disturbing empirical research evidence indicates that most dishonesty behaviors are not committed by "a few bad apples," but rather, many apples in the barrel turned out to be "a little bit bad" (Ayal & Gino, 2011). Or in other words, despite their awareness of the associated ethical or legal problems, most people conduct minor dishonest behaviors when they believe that they can get away with it (Ayal & Gino, 2011; Gino, Ayal, & Ariely, 2009; Mazar, Amir, & Ariely, 2008). Similar belief-behavior incongruity in the phenomenon of academic dishonesty was obtained in the demographically and academically diverse sample of high-school students (Stephens & Nicholson, 2008).

The Self-Concept Maintenance theory (Mazar et al., 2008) suggests that people usually conduct dishonest behaviors which they perceive as minor — a perception that enables them to maintain their self-perception as honest. Empirical evidence supports this approach showing that, given the opportunity, people engage in dishonest behaviors much more often than they care to admit, and that despite their awareness of the nature of their dishonest activities, people tend to maintain their "decent" self-image (for review see: Barkan, Ayal, Gino, & Ariely, 2012). An alternative

perspective is offered by Halevy, Shalvi, and Verschuere (2014), suggesting that most people are honest most of the time, while only a small minority is frequently dishonest.

Ethical dissonance refers to "the inconsistency between one's unethical behavior and the need to maintain a moral self-image" (Barkan et al., 2012, p. 758). This concept describes situations in which a behavioral misconduct (1) presents an inconsistency, (2) threatens one's goodness, and (3) is socially unacceptable.

The existence of ethical dissonance poses a threat to one's well-being and requires the use of tension-reduction mechanisms (Barkan et al., 2012). Examples of such mechanisms are: changing the significance of a committed behavior, emphasizing situational factors, or bending moral standards (Ariely, 2013; Ayal & Gino, 2011; Barkan et al., 2012; Gino & Ariely, 2012; Shu & Gino, 2012).

In contrast to the studies presented above that explored ethical dissonance in the general context of dishonesty, this paper presents findings from a study that examined the phenomenon of *academic* dishonesty in the principal ethnic sectors and age groups within the Israeli education system. Similarly to ethical dissonance in the general context of dishonesty, the ethical dissonance of academic dishonesty provides an important index of inconsistency between the ethical principles that students hold and the socially unacceptable behaviors they conduct.

The study employs Pavela's (1997) model in order to examine the effect of dishonesty types (i.e. cheating, plagiarism, fabrication, and facilitating the dishonesty of others) and the technology factor (dishonesty in digital and non-digital settings) on the pervasiveness of academic dishonesty and on ethical perceptions by school students. The paper also explores the ethical dissonance in academic dishonesty among students: the gap between the pervasiveness of unethical behaviors and the perception of their legitimacy (see Fig. 1).

1.3. Research hypotheses

The study examined the following four hypotheses:

1. *The existence of ethical dissonance*: Based on the Self-Concept Maintenance theory (Barkan et al., 2012; Mazar et al., 2008) and previous empirical findings (Stephens & Nicholson, 2008) of inconsistency between behavior misconduct and the perception of this behavior as illegitimate, we hypothesized that the pervasiveness of academic dishonesty would be higher than the perception of its legitimacy for all four types of dishonesty (i.e. cheating, plagiarism, fabrication, and facilitating the dishonesty of others).
2. *The main effect of dishonesty type*: There would be differences in the pervasiveness of academic dishonesty, students' ethical perceptions, and ethical dissonance between different types of dishonesty. Specifically, based on the ADM framework (Anderman & Murdock, 2011; Murdock & Anderman, 2006), we

hypothesized higher pervasiveness of facilitation and its perception as more legitimate in comparison with cheating, plagiarism, and fabrication.
3. *The main effect of the technology factor*: The use of technologies would affect the pervasiveness of dishonesty, students' ethical perceptions, and, as a result, their ethical dissonance. Based on previous findings (Grieve & Elliott, 2013; Jones, 2011; Ma et al., 2008; Peled et al., 2012) we hypothesize that, compared to a non-digital setting, in a digital setting dishonesty would be more common, and would be perceived as more legitimate. Therefore, we hypothesize that the ethical dissonance - the difference between the two - would remain unchanged in a digital setting.
4. *The interaction effect*: There would be a combined effect of the dishonesty types and the technology factor on the pervasiveness of dishonesty, on its ethical perceptions, and on the ethical dissonance. Similarly to previous results in the sample of undergraduates (Stephens et al., 2007) we hypothesize that in a digital setting plagiarism would be the most common dishonesty type and would be perceived as the most legitimate kind of dishonesty among school students. Since the ethical dissonance is defined as the difference between the pervasiveness of misconduct and the perception of its legitimacy, higher level of both of them for plagiarism in a digital setting will not affect the ethical dissonance, which would remain unchanged.

2. Method

2.1. Participants

The participants were 127 eight graders (13–14 years old) from a large urban secondary public school in Northern Israel. The school was selected because of the heterogeneous academic levels among its students and the diverse socio-economic and ethnic background. Thus, in addition to the dominant diverse population normally represented in the Israeli schools (Jews of Anglo-American, Eastern European, Asian, and African origins), about 6% of the students in this school are Arabs (4% Christians and 2% Muslims). The sample does not differ from the population in any systematic way. Because the research questionnaire included open-ended questions, students with reading and writing disabilities were excluded from this study. Sixty nine (54.3%) of the participants were females.

2.2. Procedure

The research was conducted in March 2013 and approvals were obtained from the Israeli Ministry of Education and from the University's Ethics Committee.

Before responding, participants were informed that the questionnaire was anonymous, that there was no expected or "correct"
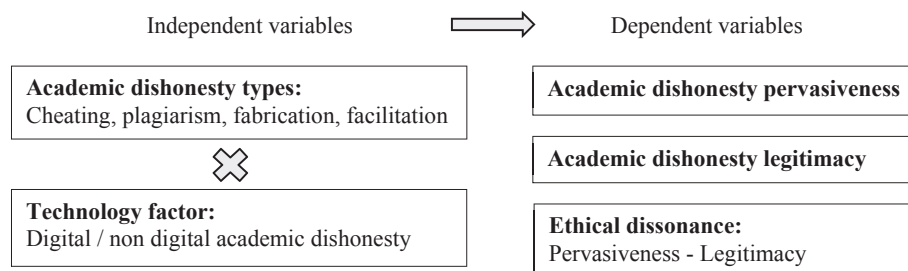
Fig. 1. The study variables.

answer to the questions and that they should express freely their own perception and opinion for each question. The research was conducted in the participants' school and classrooms. Because of the topic's sensitivity, students completed the questionnaire under the supervision of our research assistant, while their teachers were absent from the classrooms.

Answers to the questions were analyzed using the SPSS-21 program. Paired *t*-tests explored the differences between the pervasiveness of each type of academic dishonesty behavior and students' perception of its legitimacy. In order to examine whether and to what extent the use of technology affects the pervasiveness of academic dishonesty and its legitimacy perceptions, repeated measures ANOVA tests with two within-subjects factors — dishonesty type and technology - were conducted.

2.3. Instruments

The basic problem in gathering information on sensitive issues is that in a survey, respondents might be concerned with disclosing specific activities that they believe might have negative social consequences for them (Lessler & O'Reilly, 1997). Although surveys routinely offer assurances for confidentiality, research findings indicate that respondents do not always seem to trust these assurances and, consequently, when asking directly to report on their behavior in sensitive topics, in many cases they refrain from providing an accurate report (Singer & Presser, 2008). For instance, according to the National Survey of Family Growth, only 52% of the abortions performed in the US are reported by respondents in surveys (Fu, Darroch, Henshaw, & Kolb, 1998). Similar inaccuracies and underreports in using direct questions in surveys that measure socially undesirable behaviors were found in studies of alcoholism (Lemmens, Tan, & Knibbe, 1992), smoking (Patrick et al., 1994), and racist attitudes (Krysan, 1998).

In order to avoid inaccuracies that might arise from using direct questions about dishonest behavior, in this study we employed a scenario-based approach, in which the actual academic dishonest behavior can be deducted from indirect questions that follow each scenario. This technique has been used successfully in a wide range of studies on sensitive topics (for review see: Lessler & O'Reilly, 1997; Tourangeau & Yan, 2007). Additionally, in order to avoid inaccuracies that might arise from respondents' fear of authority (the teacher, in this case), the research was administered by a research assistant, with the absence of the teacher.

Two pilots were conducted before launching the main study. The purpose of the first pilot was to ensure that school students clearly understand the scenarios, which were originally developed for college-level students (Yeo, 2007) and adapted for school-level students in the present study. The purpose of the second pilot was to identify the best conditions for obtaining authentic and accurate responses from participants for the sensitive issue of academic dishonesty. We compared (1) online and offline administration of the questionnaire, (2) administering the questionnaire under the supervision of a teacher and under the supervision of our research assistant, while the teacher is absent, and (3) students' answers with and without explicit indications in the questionnaire, regarding the common existence of academic dishonesty behaviors among students ("Many children act like David … "). This research approach has been successfully employed in studies on sensitive topics (see Lee, 1993). In the pilot we found no difference between the online and the offline versions of the questionnaire. However, in the presence of teachers, as well as in absence of explicit indications in the questionnaire, regarding the pervasiveness of academic dishonesty among students, the pilot clearly showed a tendency of respondents to please the researchers by providing 'acceptable answers'. Our research methodology was based on

findings of these two pilots.

Academic Dishonesty questionnaire: Each participant completed a scenario-based questionnaire, whose design was inspired by Yeo (2007). The eight scenarios in the questionnaire (Appendix A) corresponded with Pavela's (1997) four types of academic dishonesty, and addressed them in both digital and non-digital learning settings. Face validity of the scenarios and the measures was validated by two experts — researchers in the field of academic dishonesty. The example below illustrates a scenario that examines facilitating academic dishonesty of others in a non-digital learning setting: "During a math test, David's friend passed him a note, asking for the answer to one of the test questions. David returned the note to his friend, with the requested answer." The same dishonesty type, but in a digital learning setting, was presented in the questionnaire with the following scenario: "During a math test, David's friend sent him a text message, asking for the answer to one of the test questions. David replied with the requested answer." In order to avoid the tendency of respondents to please the researchers by providing 'correct' answers, a sentence that framed the scenario within the broad context of academic dishonesty behavior appeared at the end of each scenario: "Many children act like David … "

For each dishonesty behavior described in the scenarios, participants answered questions that measured the dependent variables of the study: the pervasiveness of the dishonesty behavior presented in each scenario and the perception of its legitimacy. The participants reported on the pervasiveness of dishonest behaviors by answering the following question: "To what extent David's behavior is common among students in your class?" Answers to this question were on a Likert scale, ranging from 1 (definitely uncommon) to 6 (definitely common). In our study, the pervasiveness of academic dishonesty was found to have a normal distribution in both digital setting (range: 1 to 5.75, average: 2.89, median: 2.75, Mode: 3, SD: 1.22, skewness: 0.44) and non-digital setting (range: 1 to 5.75, average: 2.87, median: 2.75, Mode: 3, SD: 1.15, skewness: 0.43).

Participants' perceptions concerning the legitimacy of academic dishonest behaviors were measured for each scenario by the question: "To what extent does David's behavior seem legitimate to you?" The answers are on a Likert scale ranging from 1 (definitely not legitimate) to 6 (definitely legitimate). These scales were chosen to prevent the "escape" of respondents to an average answer and to enable understanding of how they conduct and whether they perceive the behavior presented in each scenario as legitimate or non-legitimate. The academic dishonesty legitimacy distribution was skewed left in both digital setting (range: 1 to 5.50, mean: 1.96, median: 1.75, mode: 1, SD: 0.95, skewness: 1.14) and non-digital setting (range: 1 to 5, mean: 1.93, median: 1.75, mode: 1, SD: 0.89, skewness: 1.26), suggesting that participants perceived dishonest behaviors as non-legitimate.

Finally, after each scenario, an open-ended question was presented: "In your opinion, how should David act in this case?" The answers to the open-ended questions are not discussed in this paper.

The *Ethical Dissonance Index (EDI)* is a measure of the ethical dissonance that learners experience when conducting academic unethical dishonest behaviors. It is calculated in this paper as the difference between the pervasiveness of dishonest behaviors reported by the participants, and the perception of the legitimacy of these behaviors. EDI was calculated for each dishonesty type, in a digital and in a non-digital setting. The EDI was normally distributed (range: from −2.75 to 4.50 [note that part of the range of the ethical dissonance is negative], average: 0.93, median: 0.73, SD: 1.28, skewness: 0.34).

3. Results

3.1. The Ethical Dissonance Index (EDI)

Table 1 presents descriptive statistics and the analysis of variance of the pervasiveness, legitimacy of academic dishonesty and ethical dissonance, separately for the learning setting (digital versus non-digital). The paired *t* tests show the differences between the pervasiveness of academic dishonesty and the perception of its legitimacy.

As can be seen in Table 1, in both digital and non-digital settings the positive value of ethical dissonance for all types of dishonest behavior indicates that the participants were aware of the unethical issues involved in academic dishonesty behaviors, as a result of the fact that the perception of academic dishonesty's legitimacy is significantly lower than its pervasiveness. The highest ethical dissonance reported in digital setting was plagiarism, while for non-digital setting the ethical dissonance for plagiarism was the lowest one. In non-digital setting the highest ethical dissonance was reported for cheating.

3.2. The digital setting and the pervasiveness of academic dishonesty

In order to examine whether and to what extent the use of technology is related to the pervasiveness of the four types of academic dishonesty, repeated measures ANOVA test with two within-subjects factors was conducted. Table 2 presents descriptive statistics.

A significant main effect of dishonesty type on the pervasiveness of academic dishonesty was found, $F(3,103) = 3.34$, $p = 0.02$, $_p\eta^2 = 0.04$. Bonferoni post-hoc comparisons for academic dishonesty types, regardless of the effect of technology, show that facilitating dishonesty of others (M = 2.65) was significantly rare compared to the other three dishonesty behaviors: cheating (M = 2.87, $p = 0.042$), plagiarism (M = 2.93, $p = 0.018$), and fabrication (M = 3.03, $p = 0.004$). The differences between these three types of dishonesty were not statistically significant.

There was no main effect of technology, $F(1,105) = 0.02$, $p = 0.884$, $_p\eta^2 = 0.00$, but the interaction between the two variables was statistically significant and the effect size was large $F(3,103) = 35.40$, $p = 0.000$, $_p\eta^2 = 0.25$. Pair comparisons of the interaction effect between academic dishonesty types and technology factor showed that cheating and fabrication are more common in the non-digital than in the digital setting (for cheating M = 3.08 vs. M = 2.67 and for fabrication M = 3.45 vs. M = 2.61,

respectively, p's = 0.000). In contrast, plagiarism is much more common in the digital setting than in the non-digital one (M = 3.53 vs. M = 2.34, $p = 0.000$). Facilitation of dishonesty of others was very similar in the digital and the non-digital settings (M = 2.64 vs. M = 2.66, $p = 0.776$).

3.3. The digital setting and the legitimacy perception of academic dishonesty

In order to examine the relationships between technology usage and the legitimacy perception of the different academic dishonesty types, a repeated measures ANOVA test with two within-subjects factors was conducted. Results are presented in Table 3.

A significant medium main effect of dishonesty types on the legitimacy perception of academic dishonesty was found, $F(3,110) = 13.18$, $p = 0.000$, $_p\eta^2 = 0.11$. Bonferoni post-hoc comparisons for dishonesty types, without considering the technology factor, showed that fabrication (M = 2.31) was perceived as more legitimate than other types of academic dishonesty (cheating, plagiarism, and facilitating dishonesty of others (M = 1.71, M = 1.97 and M = 1.81 respectively, p's = 0.000)). Plagiarism was found to be more legitimate than cheating ($p = 0.015$). No statistically significant difference was found between facilitating dishonesty of others and cheating ($p = 0.265$) or plagiarism ($p = 0.152$).

There was no main effect of technology, $F(1,112) = 0.95$ $p = 0.332$, $_p\eta^2 = 0.01$, but the interaction between the perception of legitimacy and the technological factor was statistically significant with medium effect size, $F(3,110) = 6.66$, $p = 0.000$, $_p\eta^2 = 0.06$. Pair comparisons of the interaction effect demonstrated that plagiarism and facilitating dishonesty of others are perceived as the most legitimate in the digital compared to the non-digital setting (for plagiarism M = 2.16 vs. M = 1.78, $p = 0.004$ and for facilitating dishonesty of others M = 1.88 vs. M = 1.73, $p = 0.041$). In contrast, fabrication was considered as more legitimate in the non-digital setting (M = 2.47 vs. M = 2.15, $p = 0.015$). Cheating was similarly perceived as illegitimate in both digital and non-digital settings (both M = 1.71, $p = 0.839$).

3.4. The digital setting and the ethical dissonance

In order to investigate to what extent academic dishonesty types and technological factor are related to the Ethical Dissonance Index (EDI), a repeated measures ANOVA test with two within-subjects factors was conducted. Descriptive statistics is presented in Table 4.

A significant medium main effect of the dishonesty type on the EDI were found, $F(3,100) = 4.82$ $p = 0.003$, $_p\eta^2 = 0.05$. Bonferoni

Table 1
Pervasiveness and legitimacy of AD - Descriptive statistics and *t*-tests.

	Cheating -Means (SD)	Plagiarism -Means (SD)	Fabrication -Means (SD)	Facilitation -Means (SD)	Academic Dishonesty
Non-digital setting					
Pervasiveness	3.08 (1.76)	2.34 (1.45)	3.45 (1.43)	2.64 (1.65)	**2.88 (1.13)**
Legitimacy	1.71 (1.13)	1.78 (1.15)	2.47 (1.42)	1.73 (1.15)	**1.92 (0.86)**
Ethical dissonance	1.48 (1.90)	0.54 (1.54)	1.09 (1.73)	0.96 (1.80)	**1.02 (1.30)**
Paired *t*-tests	**$t(113) = 8.29^{***}$**	**$t(114) = 3.52^{***}$**	**$t(118) = 5.91^{***}$**	**$t(117) = 5.44^{***}$**	**$t(121) = 7.78^{***}$**
Digital setting					
Pervasiveness	2.67 (1.72)	3.53 (1.35)	2.61 (1.60)	2.66 (1.64)	**2.87 (1.20)**
Legitimacy	1.71 (1.22)	2.16 (1.14)	2.15 (1.42)	1.88 (1.25)	**1.97 (0.92)**
Ethical dissonance	1.10 (1.94)	1.35 (1.72)	0.53 (1.78)	0.78 (1.74)	**0.94 (1.41)**
Paired *t*-tests	**$t(115) = 5.85^{***}$**	**$t(120) = 8.99^{***}$**	**$t(112) = 3.15^{***}$**	**$t(117) = 4.85^{***}$**	**$t(121) = 7.40^{***}$**
Total					
Pervasiveness	2.90 (1.62)	2.94 (1.18)	3.01 (1.28)	2.61 (1.47)	**2.86 (1.07)**
Legitimacy	1.63 (1.00)	1.98 (1.07)	2.28 (1.12)	1.79 (1.11)	**1.93 (0.79)**
Ethical dissonance	**1.26 (1.73)**	**0.95 (1.36)**	**0.72 (1.47)**	**0.81 (1.54)**	**0.94 (1.18)**
Paired *t*-tests	**$t(117) = 7.66^{***}$**	**$t(121) = 7.86^{***}$**	**$t(119) = 5.15^{***}$**	**$t(119) = 5.78^{***}$**	**$t(121) = 8.0^{***}$**

$^{***}p = 0.000$.

Table 2
Descriptive statistics of dishonesty pervasiveness in digital and non-digital contexts.

Technology factor	Cheating -Means (SD)	Plagiarism -Means (SD)	Fabrication -Means (SD)	Facilitation -Means (SD)	Academic Dishonesty
Non-digital context	3.08 (1.76)	2.34 (1.45)	3.45 (1.43)	2.64 (1.65)	**2.88 (1.13)**
Digital context	2.67 (1.72)	3.53 (1.35)	2.61 (1.60)	2.66 (1.64)	**2.87 (1.20)**
Total	**2.90 (1.62)**	**2.94 (1.18)**	**3.01 (1.28)**	**2.61 (1.47)**	**2.86 (1.07)**

Table 3
Descriptive statistics for legitimacy of dishonesty types in digital and non-digital formats.

Technology factor	Cheating -Means (SD)	Plagiarism -Means (SD)	Fabrication -Means (SD)	Facilitation -Means (SD)	Academic Dishonesty
Non-digital context	1.71 (1.13)	1.78 (1.15)	2.47 (1.42)	1.73 (1.15)	**1.92 (0.86)**
Digital context	1.71 (1.22)	2.16 (1.14)	2.15 (1.42)	1.88 (1.25)	**1.97 (0.92)**
Total	**1.63 (1.00)**	**1.98 (1.07)**	**2.28 (1.12)**	**1.79 (1.11)**	**1.93 (0.79)**

Table 4
Descriptive statistics for the ethical dissonance types in digital and non-digital formats.

Technology factor	Cheating -Means (SD)	Plagiarism -Means (SD)	Fabrication -Means (SD)	Facilitation -Means (SD)	Academic Dishonesty
Non-digital context	1.48 (1.90)	0.54 (1.54)	1.09 (1.73)	0.96 (1.80)	**1.02 (1.30)**
Digital context	1.10 (1.94)	1.35 (1.72)	0.53 (1.78)	0.78 (1.74)	**0.94 (1.41)**
Total	**1.26 (1.73)**	**0.95 (1.36)**	**0.72 (1.47)**	**0.81 (1.54)**	**0.94 (1.18)**

post-hoc comparisons for the effect of academic dishonesty types, without considering the impact of technology, showed that the EDI for cheating (M = 1.29) is significantly higher than plagiarism (M = 0.95, p = 0.022), fabrication, and facilitating dishonesty of others (M = 0.82 and M = 0.87 respectively, p's = 0.000). Other comparisons were not statistically significant.

The main effect of the technology was not statistically significant, $F(1,102)$ = 0.84 p = 0.363, $_p\eta^2$ = 0.01, but the interaction between the dishonesty type and the technological factor on the EDI was statistically significant with medium effect size, $F(3,100)$ = 14.06, p = 0.000, $_p\eta^2$ = 0.12. Pair comparisons of the interaction effect showed that the EDI was higher in the non-digital than in the digital setting for cheating (M = 1.48 vs. M = 1.10, p = 0.002) and fabrication (M = 1.09 vs. M = 0.53, p = 0.009). In contrast, EDI for plagiarism was significantly higher in the digital setting (M = 1.35 vs. M = 0.54, p = 0.000). For facilitating dishonesty of others, the EDI difference between digital and non-digital settings was not statistically significant (M = 0.96 vs. M = 0.78, p = 0.425).

4. Discussion

In our competitive education systems, learners constantly face the cost-benefit ethical dilemma between sticking to the norms of academic honesty or risking violation of these norms by conducting acts of dishonesty in order to gain higher grades or social status. In the era of free access to information, where the boundaries between authentic and plagiarized knowledge become blurred and where technologies for sharing information penetrate all social echelons and age groups, this ethical dissonance becomes a crucial issue for learners in both schools (Blau & Eshet-Alkalai, 2014) and universities (Friedman et al., 2016a).

This study examined the effect of academic dishonesty types (i.e. cheating, plagiarism, fabrication, and facilitating the dishonesty of others) and the technology factor (digital versus non-digital setting) on the pervasiveness of academic dishonesty, on the perception of its legitimacy by school students, and on the ethical dissonance which present-days learners face. The Ethical Dissonance Index (EDI) presented in this study is measured as the difference between the pervasiveness of academic dishonesty and the perception of its legitimacy.

All four types of academic dishonesty described in Pavela's (1997) conceptual framework were reported in this study as behaviors existing in the classroom and conducted in both digital and non-digital settings. No new types of dishonest behavior were reported in this study, as well as in a separate study in which parents and teachers of the same students were interviewed (Blau et al., 2014; Rotem, Blau, & Eshet-Alkalai, 2016), and in a study that analyzed protocols of the Disciplinary Committee at a large University that represent all of the offenses examined by the Committee during one and a half years (Friedman et al., 2016a; Friedman, Blau, & Eshet-Alkalai, 2016b). These findings provide a contemporary empirical support for the validity of Pavela's conceptual framework of academic dishonesty, despite the fact that it was established before the recent proliferation of technologies for communication and information-sharing.

In accordance with our *first hypothesis*, it was found that for all four dishonesty types, in both digital and non-digital settings, the reported pervasiveness of dishonest behavior was significantly higher than its perceived legitimacy (i.e. a positive EDI). This suggests that being aware of the ethical issues involved in academic dishonesty does not necessarily prevent students from actually committing it. Similarly, finding among university students indicated (Friedman et al., 2016a) that most students who were caught on academic dishonesty (almost 60%) claimed that they had acted innocently, in the belief that what they did was legitimate. In contrast to our hypothesis, participants did not report a similar level of ethical dissonance for the same types of dishonest behavior in the digital and the non-digital settings. The highest ethical dissonance was reported for digital plagiarism, while in the non-digital setting the level of ethical dissonance for plagiarism was the lowest. Since the ethical dissonance is the difference between the pervasiveness of misconduct and the perception of its legitimacy, we hypothesized that a higher level of both of them for plagiarism in the digital setting will not affect the ethical dissonance, which would remain unchanged. In fact, only the pervasiveness of digital plagiarism was found to be high, while the perception of its legitimacy was slightly above the average. These findings are in accordance with claims made by researchers of behavioral ethics (e.g. Ariely, 2013; Ayal & Gino, 2011; Barkan et al.,

2012; Gino & Ariely, 2012; Shu & Gino, 2012), that people tend to conduct dishonest behaviors despite their awareness of the associated ethical problems. On the other hand, our findings contradict the claim that a lack of awareness of the problems of violating academic integrity plays a pivotal role in the reported growth in academic dishonesty among the "millennium generation" (Gross, 2011; Ma et al., 2008; Thomas & Zyl, 2012). The research findings suggest that our participants — net-generation school students — do not conduct dishonesty acts out of naïveté, and that they understand clearly the illegitimacy of their academic dishonesty behavior.

In accordance with our *second hypothesis*, differences were found in the pervasiveness of dishonesty, the perception of its legitimacy, and the ethical dissonance as a function of the type of dishonesty. However, in contrary to the second hypothesis, facilitation was neither the most prevalent nor perceived as the most legitimate form of academic dishonesty. In fact, concerning the pervasiveness, participants assisted each other in conducting academic dishonest activities significantly less than they themselves were involved in cheating, plagiarism, or fabrication. This finding is consistent with data of students in academia (Friedman et al., 2016a) among whom the level of facilitation, both digital and analogical, was found to be very low. Regarding the legitimacy of academic dishonesty, fabrication is perceived as the most legitimate type and plagiarism is perceived as more legitimate than cheating. The perception of fabrication as the most legitimate type of academic dishonesty is consistent with very few examples of fabrication in interviews with teachers and parents (Blau et al., 2014; Rotem et al., 2016) and its total absence in the offences conducted by university students and examined by the Disciplinary Committee (Friedman et al., 2016a,b). As for ethical dissonance, the greatest dissonance between the perception of dishonesty as problematic and its actual practice was found in cheating. We based this hypothesis on the difference in students' assessments of costs associated with achieving their goals, as stated by the ADM framework (Anderman & Murdock, 2011; Murdock & Anderman, 2006). Specifically we assumed that compared to students who are involved in cheating, plagiarism, or fabrication, students who facilitate academic dishonesty of others will have better self-image as "good friends" willing to help their peers. However, our participants may take into consideration additional costs associated with facilitation. An example of such cost is described by Laura, a high-school student interviewed by Stephens and Nicholson (2008). Laura was striving to gain admittance to an elite university and was aware that her facilitation in academic dishonesty of other students may disadvantage her. In the competition for grades she described her loss in terms of class rankings and teachers' perceptions of who are the most "successful" students. This and other potential costs may be closely investigated in future studies in order to better understand pervasiveness of academic dishonesty types and perception of their legitimacy.

Contrary to the *third hypothesis* of our research, no effect was found for the technology factor for any of the dependent variables. This is consistent with finding reported by Friedman et al. (2016a) indicating that 68.8% of the academic dishonesty behaviors of university students sentenced by the Disciplinary Committee during one and a half years were analogical dishonesty, while only 31.2% were digital acts of dishonesty. Thus, it seems that the use of technological devices per se does not significantly affect the phenomenon of academic dishonesty. Our results in the sample of school students are consistent with previous research which failed to find differences in the involvement of undergraduates in digital and conventional academic dishonesty (Stephens et al., 2007). Both Stephens et al.'s (2007) and our results do not support the common belief of technological determinism, which assumes that

technologies can produce social or behavioral changes (Nye, 2007) and empirical results showing differences between academic dishonesty behaviors in digital versus non-digital settings (Peled et al., 2012). These differences might be related to the learning settings: online or face-to-face course in Peled et al.'s paper versus digital or non-digital learning situation in Stephens et al.'s (2007) and in our study. However, these differences may also suggest an alternative answer to the technological determinism question, that digital technologies are conduits and not causes of academic dishonesty (McCabe & Stephens, 2006; Stephens et al., 2007). More studies are needed in order to explore these possible explanations.

On the other hand, in accordance with our *fourth hypothesis*, a combined effect was found for technology and type of academic dishonesty for all the dependent variables. We found that the use of digital devices may increase the magnitude of plagiarism, while cheating and fabrication are actually more commonly found in dishonest behaviors that do not employ technological devices. Previous study of academic dishonesty in higher education (Friedman et al., 2016a,b) similarly reported that plagiarism was more prevalent in digital setting, while the level of cheating was significantly higher in analogical environment. Plagiarism and helping others to conduct dishonest activities were perceived in our study as more legitimate in the digital setting. Concerning the ethical dissonance, in contrast to our hypothesis, the interaction effect was also statistically significant. We found that for plagiarism, it is higher in the digital setting, whereas for cheating and fabrication, it is higher in the non-digital setting. Findings of the current study regarding differences in the level of plagiarism with or without the use of technology do not concur with those of Selwyn (2008), who reported on a strong correlation between the online and offline plagiarism. These differences might be related to the research population (school students in the current study versus college students in the study of Selwyn), or to the large sample of Selwyn's study (n = 1222), which makes findings more likely to reach statistical significance, but does not necessarily indicate that the effect size is large.

4.1. Conclusions and educational implications

To the best of our knowledge, this is the first study that utilized Pavela's conceptual model to compare digital and non-digital academic dishonesty among school students. Following the significant differences in pervasiveness of the same academic dishonesty types in both digital and non-digital settings found in this study and considering the limited group size and diversity in our study, we recommend employing a similar research setting with participants of different age and socio-demographic background. This will improve our grasp of the yet-not fully-understood phenomenon of academic dishonesty in the information era.

Despite the tendency to "blame" technology as a major vehicle of promoting academic dishonesty (Stronger, Miller, & Marcum, 2013), our results also show that the use of technology per se does not significantly affect academic dishonesty. This may provide an alternative answer to the technological deterministic question, that digital technologies are conduits and not causes of academic dishonesty. More studies are needed in order to explore these possible explanations.

On a practical level, our findings indicate that ethical issues play a pivotal role in academic dishonesty and suggest that they should be treated effectively in order to deal with academic dishonesty. In the context of *digital* dishonesty, the interaction effects found in this study suggest that emphasis should be placed on educational activities that raise students' awareness of the ethical problems involved in plagiarism and facilitating the dishonesty of others. On the other hand, for academic dishonesty in *non-digital* settings, our

findings indicate that educational interventions might be more effective when coping with cheating and data fabrication.

We can recommend two types of strategies (i.e. pedagogical and technological) that educators and administrators may employ in order to cope effectively with digital and non-digital academic dishonesty behaviors in schools. From the pedagogical perspective, our findings suggest that in order to decrease digital plagiarism and facilitation, educators should create assignments which are meaningful and relevant for students. Offering students a choice from a variety of topics and incorporating reflection elements in the assignments helps personalizing the assignments and reduces academic dishonesty. Also, breaking down complex assignments into a series of simple tasks can be very helpful in avoiding last-minute preparations of complete learning outcomes that trigger digital plagiarism and requests for facilitation. From the technological perspective, our findings suggest that the utilization of technological tools by teachers, in order to compare similarity between digital texts, might be useful in identifying and, more importantly, preventing plagiarism and fabrication. This requires that teachers move from hand-written to digital submission of assignments and inform their students in advance that these tools will be used to insure the absence of academic dishonesty.

This study was conducted on a relatively small sample of middle-school students. Future replications on a larger sample and more varied age, ethnic groups, and socio-economic backgrounds are necessary in order to confirm the conclusions of this study.

Acknowledgements

Appendix A. Academic dishonesty scenarios

Each of the eight scenarios presented below is followed by **two multiple choice, Likert-scale questions**:

Many children act like David. To what extent David's behavior is common among students in your class? [Pervasiveness]

1 = definitely uncommon, 2 = uncommon, 3 = quite uncommon, 4 = quite common, 5 = common, 6 = definitely common

To what extent does David's behavior seem legitimate to you? [Legitimacy]

1 = definitely not legitimate, 2 = not legitimate, 3 = quite not legitimate, 4 = quite legitimate, 5 = legitimate, 6 = definitely legitimate

Academic dishonesty Scenarios (in digital/non digital settings):

1.1. [Fabrication, non-digital setting] For their geography lesson, students were asked to write a description of a place they have visited. Instead of describing a place he visited, David found pictures and descriptions of a tourist attraction in a tourist booklet and wrote about a place he never visited.

3.2 [Plagiarism, digital setting] One evening David discovered that he forgot to prepare an essay for tomorrow's language lesson. He found his friend's laptop, with the essay in it. David edited the file of his friend's essay — changed some words, added some sentences, typed his name, and printed it. The next day he submitted the essay to the teacher as his own.

2.1 [Facilitation, digital setting] During a math test, David's friend sent him a text message (SMS), asking for the answer to one of the test questions. David replied with the requested answer.

4.2 [Cheating, non-digital setting] For a dictation during an English [SL] class, David prepared and hid in his pocket a list of new words, in order to spell them correctly during the dictation.

3.1 [Plagiarism, non-digital setting] One evening, David discovered that he forgot to prepare an essay for tomorrow's language lesson. He found his friend's notebook, with the essay in it. David copied parts of the friend's essay into his own notebook, changed some words, and added some sentences. The next day he submitted the essay to the teacher as his own.

1.2 [Fabrication, digital setting] For their geography lesson, students were asked to prepare a PowerPoint presentation describing a place they have visited. Instead of describing a place he visited, David found pictures and descriptions of a tourist attraction on the Internet and prepared the presentation about the place he never visited.

4.1 [Cheating, digital setting] For a dictation during his English [SL] class, David prepared and hid in his smartphone a list of new words, in order to spell them correctly during the dictation.

2.2 [Facilitation, non-digital setting] During a math test, David's friend passed him a note, asking for the answer to one of the test questions. David sent the note back to his friend with the requested answer.

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