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The influence of personality on social participation in learning environments

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Abstract

The impacts of the instructional environment (classroom vs. Web-based instructional environment—WBIE) and personality differences on students' social participation were examined among 214 university students. Students reported their attendance, willingness to participate and actual participation in each instructional environment. Students' personality traits were measured by the Big Five Inventory. It was found that despite of frequent attendance to both educational environments, the classroom seems to enhance students' active participation whereas WBIE appears to inhibit it. Participants in class were more extroverted, open to new experiences and emotionally stable, relative to non-participants. Such differences were not found between WBIE participants and non-participants. Students who actively participated only in WBIE were more introverted and more neurotic than students who participated in both environments, students who did not participate in either instructional environment, or students who participated exclusively in class. These results point to the psychological impact of the two instructional environments, and suggest viewing social participation as a result of educational context while individual differences play secondary role.

Keywords: Personality; Big Five; Participation; Classroom; Web-based instruction

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1. Introduction

Human behavior has both extrinsic and intrinsic determinants. This paper focuses on academic behavior, and in particular on participation in class, and two of its antecedents: the instructional environment (an extrinsic determinant) and personality traits (an intrinsic determinant). Two instructional environments were compared: a face-to-face classroom environment and a Web-based instructional environment (WBIE). We contend that if a student participates in both environments to the same degree, this can be attributed to personality, because classroom participation may be a manifestation of personality traits (for instance, extroversion). However, if a student participates in one environment but not in the other, this may reflect the impact of the medium, although the role of personality cannot be ruled out. In order to test this hypothesis, we focused on (1) students' willingness to participate in the instructional environments, (2) students' actual participation in the environment, (3) the relations between these two measures within each environment, and (4) the correlation between participation in the two environments. In addition, we examined personality differences among students in order to clarify whether personality traits can explain differences in the above measures.

1.1. Participation in academic activities

Students' participation in academic activities is often divided into "academic engagement"—behavior related directly to the learning process; for example, time on task or participation in organized learning activities; and "social engagement"—the nature of students' interaction with instructors or peers (Finn, Pannozzo, & Achilles, 2003). Both forms of participation show consistent correlations with academic performance (Finn et al., 2003; Finn, Pannozzo, & Voelkl, 1995; Marks, 2000; McDermott & Beitman, 1984). Studies show that attending and responding to the instructor as well as self-initiated participation are related to achievement (Kerr, Zigmond, Schaeffer, & Brown, 1986). Research on college students has shown that the time and energy students devote to educationally purposeful activities is the best predictor of their learning performance (Astin, 1993). Nevertheless, it is unclear whether it is classroom participation per se that helps students to construct meaningful knowledge or whether it is their overall higher ability that is manifested in active participation. Marks (2000) reported that differences between students rather than differences between classes or schools were responsible for the majority of variability in academic engagement, thus emphasizing the role of students' personality over environmental factors. In this paper the terms "classroom participation" and "participation" denote "social engagement" or "social participation".

Instructional theories emphasize the advantageous of active learning, including participation in academic activities. The constructivist view maintains that knowledge is socially and actively acquired (Jonassen, 1991; Vygotsky, 1962). Therefore, in order to construct knowledge, students have to struggle with a variety of opposing understandings (Perkins, 1991); for example, by collaborative problem solving (Cunningham, 1992), argumentation, reflection, or primarily through discussions (Garrison, 1989; Kanuka & Anderson, 1999). In terms of the activity theory of learning, the influence of activity on learning is clear: "As we act we gain knowledge, which affects our actions, which changes our knowledge, and so on" (Jonassen & Rohrer-Murphy, 1999, pp. 64–65).

Very few published research documented students' social participation in class. Hall, Delquadri, Greenwood, and Thurston (1982) found that elementary pupils asked questions or responded to the teacher during only 1% of the school day. Nunn (1996) reported that in college courses only about 6% of the time was devoted to classroom discussion and only about 25% of the students took part in these

discussions. The level of active engagement in American colleges is measured annually through the National Survey of Student Engagement (NSSE). These surveys found that 25% of first year students reported that they asked questions in class or contributed to class discussions "very often". Of the seniors, 39% reported that they engaged in these activities "very often". When asked to what extent they worked with other students on projects during class, only 8–9% of the first year students and 13% of the seniors reported they did so "very often" (NSSE, 2002, 2003). Gorsky, Caspi, and Trumper (2004) reported that only about 7–8% of the students attending any given lecture in a large course at a university actually posed questions that the lecturer addressed, an estimate based on lecturers' reports. Thus, despite the ostensible benefits of active participation, students do not, in fact, participate in class to a high degree.

The pattern of low social participation may, in part, result from environmental factors like instructional design. Instructors seem to prefer instructivism over constructivism, and leave minimal opportunity for students to engage in social participation through class discussion. Pedagogical factors may also contribute to the low rate of social participation. For example, in order not to demean shy or introverted students, instructors may consciously decide not to assess students according to participation in class discussions. In addition, recording social participation is problematic, and participation scores for a given individual are difficult to justify if challenged (Jacobs & Chase, 1992). When students recognize that social participation is not graded, they may value only those portions of a course that are visibly graded, hence avoid participation (Marzano et al., 1988).

1.2. Media differences: classroom and WBIE participation

The penetration of Web-based instructional media such as synchronous or asynchronous computer conferencing provided new opportunities for students to participate in academic activities (Harasim, Hiltz, Teles, & Turoff, 1995), which seem to be crucial to a successful online learning process (Brown, 1997; Klemm, 1998; Sutton, 2001). However, research indicates that the picture is more complex. First, student participation is low. Caspi, Gorsky, and Chajut (2003) examined the rate of student participation in non-mandatory WBIEs. They found that only 12–18% of the students participated, and of these, most posted message only once. The picture in compulsory WBIEs is similar: Although students receive credit for participation, they participate only minimally (Bullen, 1998; Hammond, 2000; Hara, Bonk, & Angeli, 2000; Kelsey, 2000; Palonen & Hakkarainen, 2000; Pena-Shaff & Nicholls, 2004). Second, there are problems in creating and sustaining a Web-based learning community, and the differences between that environment and a face-to-face environment (i.e., lack of placedness and synchronicity) may be more fundamental than the absence of body language and social presence (Anderson, 2004). Third, in contrast to the reported positive correlations between class participation and academic performance, in WBIEs it was found that "lurkers" (i.e., passive students) scored similarly to (Taylor, 2002) or even

Table 1
Structural differences between classroom and WBIE

	Classroom	Web-based instructional environment (WBIE)
Place	Spatially defined	Virtually defined
Attendance (presence/absence)	Visible	May be invisible (lurkers)
Contribution to discussion	Oral, body language	Written
Responsiveness	Immediate	Delayed (in asynchronous conferencing)
Record	Depends on note-taking	Printed

higher than active participants (Beaudoin, 2002). What are the differences between in-class and WBIE academic participation? Table 1 summarizes some of the *structural* differences.

Apart from the structural differences, some *psychological* differences may exist. Here are few noticeable examples of psychological consequences of WBIE.

Norms and commitment. Contrary to face-to-face meetings, using the virtual instructional environment usually does not require following established norms. For example, in the virtual environment, students can choose not to read the answers to questions they raised, they are not threatened by direct questions from other participants, or criticized for not taking an active role. This in turn may result in a low level of commitment in a WBIE relative to a face-to-face environment.

Socialization, the student's role and self-expectation. Another difference may relate to the student's knowledge of what it means to be a student in a specific environment. Socialization to class rules begins very early in the student's life, whereas in WBIE, it may start much later, and therefore may be less clear. As a result, the level of self-expectation may be lower in WBIE relative to the classroom. Since socialization is slow and roles are ambiguous, students' self-expectation may be blurred.

Sense of community. While in face-to-face classes there are many aids to building a sense of community, in the WBIE the impact of these aids is reduced, and great effort is needed to establish a sense of community.

Reflection and higher-order thinking. Lastly, due to its asynchronous nature and the fact that participation is recorded, the WBIE may afford time for deeper reflection and perhaps for higher-order thinking, relative to the face-to-face environment.

These differences between the two instructional environments may encourage different students to participate, based on their own needs or personalities. Nonetheless, comparing the evidences collected separately within each environment may reveal that most students do not participate whatsoever. If the same type of students always participate, it may be possible to identify them according to their personality profile. However, it is also possible that it is *not* the same students that participate in each instructional environment; therefore a different personality profile will emerge for participants in one environment and participants in the other. A major benefit of the current study is that it compares the same student's behavior in two different instructional environments.

An interesting measure of the impact of the environment on behavior is the difference between the willingness to do something and actually doing it. Consider a student who wants to contribute a comment or ask a question in the classroom. She can raise her hand, signifying the will to participate but the teacher may not give her the floor. In such a case, her willingness may not be put into practice because of the teacher. But it is also possible that she wants to participate but does not raise her hand, thus no one knows that she wants to participate, and therefore her willingness was not put into practice because she did not signify it. Thus, measuring *willingness* to participate may provide a baseline to test the effect of different instructional environments on participation.

1.3. The impact of individual differences on students' learning

There is wide agreement that the five-factor model of personality, often termed the 'Big Five' (Goldberg, 1990), can be used to describe the most salient aspects of personality. The five-factor structure has been generalized across measures, cultures, and sources of ratings (McCrae & John, 1992). The relation between each of the five factors of personality with learning performance has been widely explored and revealed mixed results. Farsides and Woodfield (2003) reviewed a large number of studies

that aimed to find the relation between each of the five factors and academic performance. There is considerable positive evidence regarding four factors that are theoretically expected to be related to academic performance (conscientiousness, openness to experience, neuroticism and extroversion), but also some negative observations. There is no obvious theoretical justification for the correlation of the fifth factor (agreeableness) with academic achievement; nevertheless some positive evidence does exist.

Conscientiousness (characterized as being purposeful, strong-willed, responsible, and trustworthy) has the strongest and most stable relationship with academic performance (Blickle, 1996; Busato, Prins, Elshout, & Hamaker, 2000; Chamorro-Premuzic & Furnham, 2003; Lounsbury, Sundstro, Loveland, & Gibson, 2003). Openness to experience (people who are open-minded, have active imaginations, prefer variety, and show independence of judgment) was also associated with academic achievement (Blickle, 1996; Lounsbury et al., 2003). Students who score high on this trait perform better than those who score low (but see Busato et al., 2000, for opposite findings). Neuroticism is the opposite of emotional stability, a dimension which generally predicts university success (e.g., Cattell & Kline, 1977; Sanchez-Marin, Rejano-Infante, & Rodriguez-Troyano, 2001): emotionally stable students perform better than neurotic students. However, some studies obtained mixed results (e.g., Furnham & Mitchell, 1991) or no correlation (Farsides & Woodfield, 2003). The relation between extroversion (sociability and assertiveness) and learning performance is controversial (Chamorro-Premuzic & Furnham, 2003). Some studies found that introverts perform better than extroverts (e.g., Entwistle & Entwistle, 1970; Sanchez-Marin et al., 2001), while in other studies (Chamorro-Premuzic & Furnham, 2003; Farsides & Woodfield, 2003; Kline & Gale, 1971), this finding was not replicated. As already mentioned, agreeableness (altruistic, sympathetic, and readily helpful people) is not a significant predictor of learning success (Chamorro-Premuzic & Furnham, 2003) but some exceptions have been recorded (e.g., Rothstein, Paunonem, Rush, & King, 1994).

Is participation in class predicted by personality traits? To the best of our knowledge, very few published papers reported on the relationship between participation in class and personality traits. Furnham and Medhurst (1995) tested the relation between personality and several class behaviors as rated by the instructors. These behaviors included grasp of subject matter, work habits, motivation, written expression, oral expression, and amount of participation. They found that extroversion is positively correlated with participation in class. However, they did not use the Big Five instrument. In follow-up studies, Furnham, Chamorro-Premuzic, and McDougall (2002) observed significant correlations between conscientiousness, agreeableness and class behavior, while Chamorro-Premuzic and Furnham (2003) did not find any significant correlation between any of the five factors and class behavior. However, in these reports, class participation was reported as part of a general index (class behavior) rather than as a single predicted behavior.

Is participation in WBIEs predicted by personality traits? Despite the notion that WBIE is well suited to introverted students (e.g., Berge, 1997) we found no reports of correlations between Big Five factors and WBIE participation. However, in studies conducted in a non-academic context that reported on correlations between personality traits and Internet usage, mixed results were obtained (Hamburger & Ben-Artzi, 2000; Hills & Argyle, 2003; Scealy, Phillips, & Stevenson, 2002; Swickert, Hittner, Harris, & Herring, 2002; Tuten & Bosnjak, 2001; Wolfradt & Doll, 2001).

2. Research questions

The rationale of the current research is as follows: First, to discover the relation between willingness to participate in one instructional environment and the willingness to participate in the other

environment, and the relation between actual participation in one environment and actual participation in the other. Correlation between these measures indicates that despite structural and psychological differences, environment has *no* effect on participation.

Second, within both instructional environments, we tested the relation between willingness to participate and actual participation, as well as the relation between Big Five factors, willingness to participate and actual participation. Different patterns of relations may be attributed to environmental differences, whereas a similar pattern may be attributed to students' personality.

The research questions are thus the following:

(1) Do the same students participate in both instructional environments? In other words, does participation in one environment predict participation in the other?
(2) Does the instructional environment enhance or inhibit students' participation? What are the relations between willingness to participate and actual participation in each of the two instructional environments?
(3) If indeed an instructional environment enhances or inhibits students' participation, are there any personality differences between students who actually participated and those who did not, in the two different environments?
(4) Does classroom participation relate to student's personality? If classroom participation is predicted by extroversion (Furnham & Medhurst, 1995), conscientiousness, and agreeableness (Furnham et al., 2002), do classroom participants and non-participants differ in their personality traits? A similar question regarding the correlation between participation and student's personality was asked regarding the WBIE—do WBIE participants and non-participants ("lurkers") differ in their personality traits?

3. Method

The present study was conducted at the Open University of Israel (OUI) which is a distance learning institution. Upon registration, students receive the course material (specially written materials for distance learning), a time schedule and a set of assignments. During the semester, students can participate in optional face-to-face tutorial sessions located near their places of residence. Tutorial sessions are the equivalent of the classroom in OUI terminology. A website is available for each course which contains additional study material as well as administrative information and a discussion forum.

3.1. Population

At the end of the 2004 spring semester, a Web-based questionnaire was distributed via e-mail to 646 students registered in the course "Research Methods" and whose e-mail address appeared on the course mailing list. Of these, 214 students (32.3% males) responded. The age range was 17–57 (mean: 27.6, S.D.: 5.99).

3.2. Measures

The questionnaire had three sections: (a) Questions about students' classroom behavior; (b) questions about students' WBIE behavior; (c) a Hebrew translation of John, Donhaue, and Kentle's (1991) 44-item

Table 2
Five factors: means, Cronbach's alpha and cross-correlations

	Mean	Alpha	(1)	(2)	(3)	(4)
Neuroticism (1)	66.85	0.821				
Agreeableness (2)	74.09	0.573	−0.267**			
Extroversion (3)	56.01	0.785	−0.237**	0.194*		
Conscientiousness (4)	69.72	0.724	−0.289**	0.255**	0.306**	
Openness (5)	42.07	0.802	−0.210**	0.143*	0.297**	0.145*

* $p<0.05$.
** $p<0.01$.

"Big Five Inventory" (BFI). The classroom and WBIE behavior sections (see Appendix A) were given in random order to students. The BFI was always given last. BFI items are rated on a 5-point scale ranging from 1 (disagree strongly) to 5 (agree strongly). We followed Srivastava, John, Gosling, and Potter (2003) and scored the BFI using an intuitive metric known as 'percentage of maximum possible' (POMP) scores (Cohen, Cohen, Aiken, & West, 1999). A POMP score is a linear transformation of any raw metric into a 0 to 100 scale, where 0 represents the minimum possible score and 100 represents the maximum possible score. Cohen et al. (1999) recommended POMP scores as a universal metric that is more intuitive than scale scores with idiosyncratic ranges. The 1-to-5 BFI metric was transformed into POMP scores by subtracting 1 and multiplying by 25. The BFI's inter-item correlations, along with factor means and Cronbach's alpha, are presented in Table 2.

4. Results

4.1. Class attendance and forum login

All students reported some participation in tutorial sessions. 63.8% of the students reported that they attended all the sessions. Another 33.3% reported they attended most sessions. Only 2.9% reported attending a small number of sessions. We asked three tutors to estimate students' attendance in class sessions. They estimated that about 90% of students attended most class sessions, hence validating the students' self-reports.

The distribution of the time intervals of students' self-reported logins to the course forum is presented in Fig. 1. 62.3% reported they logged in the course forum at least once a week. Others logged in the course forum less frequently. An analysis of the Website log file reveals similar results.

The relation between attendance at tutorial sessions and logins on the forum was tested. Table 3 presents the distribution. This relation was not found to be significant by the chi-square test ($p=0.09$). Almost half (46.39%) of the students attended all tutorial sessions and logged in to the course forum on a weekly basis.

4.2. Class: willingness to participate and actual participation

How many students wanted to participate actively in tutorial sessions, and did this correlate with actual participation? First, 70% reported they often, almost always or always wanted to actively

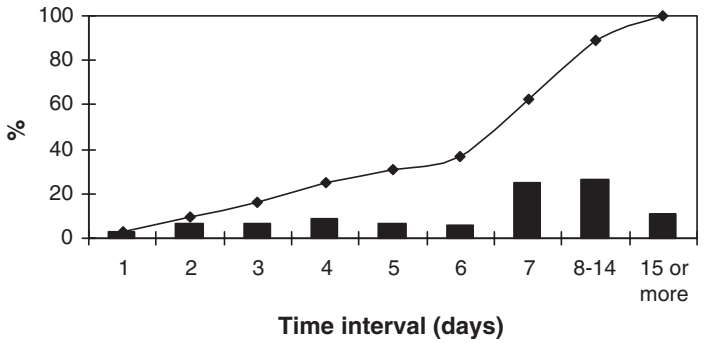

Fig. 1. Frequencies (bars) and cumulative percentages (line) of time interval in students' login to course forum.

participate in class. The relation between this willingness and its implementation is shown in Table 4. Cramer's Phi correlation was 0.62 ($p<0.05$). Of those who did not actively participate, 73.6% indicated that they did not want to.

The amount of actual class participation was as follows: 30.8% never participated, 25.4% participated to a very minimal degree (once, twice or no more than three times during the last three tutorial sessions), 43.8% participated often (between 4 and 15 times in three sessions). Tutors' estimations of class participation validated the students' self-reports.

4.3. WBIE: willingness to participate and actual participation

Only 18% reported wanting to post a message in the course forum. The correlation between willingness to post a message and actually posting one is shown in Table 4, and is significant (Cramer's Phi was 0.37, $p<0.05$). Most students who avoided posting messages on the site did so because they did not want to (87.3%). The amount of actual posting of messages in the WBIE was as follows: 82% never posted, 15.3% posted very few messages (once, twice or no more than three messages), only 2.7% posted more often (between four and seven messages). Log file analysis validated these reports.

There are clear differences between the two learning environments. First, in the classroom, most students wanted to participate, whereas in the WBIE, less than 20% did (Z test=9.87, $p<0.001$). Second, class participation was much larger than posting messages on the WBIE (Z test=8.88, $p<0.001$). Third, the correlations between willingness to participate and actual participation significantly differed between the two instructional environment (Z test=3.35, $p<0.001$).

Table 3
Relation between class attendance and forum login (in percentages)

		Login to course forum		
		At least once a week	About once every 2 weeks	Less than every 2 weeks
Attend tutorial sessions	Few	1.20	1.20	0.60
	Most	14.46	11.45	4.22
	All	46.39	13.86	6.63

Table 4
Willingness to participate and actual participation in class and WBIE (in percentages)

		Want to participate/post	Do not want to participate/post
Class	Participate in fact	62.1	7.9
	Do not participate	7.9	22.1
WBIE	Post in fact	6.9	5.3
	Do not post	11.1	76.7

Crossing classroom and WBIE participation yielded four groups of students: (1) 12.9% of the students participated in both learning environments; (2) 57.5% of the students participated only in class; (3) 5.4% of the students participated only in the WBIE; and (4) 24.2% of the students participated neither in class nor in the WBIE. There was no significant correlation between class participation and WBIE participation, seemingly evidence of the influence of the environment.

4.4. Personality differences: participants and non-participants in class and WBIE

What are the personality traits that distinguish participants from non-participants? Table 5 shows that in class, there are significant differences between participants and non-participants in neuroticism, extroversion and openness. Participants score lower than non-participants on neuroticism and higher on extroversion and openness.

Does the personality of "lurkers" differ from active posters in the WBIE? Table 5 shows that there are no significant differences in personality characters of students who posted messages on the course forum and those who did not.

The difference in personality factors between the four groups of students (participation/non-participation in both environments, or participation in only one environment) is presented in Table 6. Significant differences were found for extroversion and neuroticism. Schaffe's post-hoc tests revealed that students who only participated in class are more extroverted than their peers who participated in both environments and also relative to students who participated only in the WBIE. Students who participated solely in the WBIE are more introverted than students who did not participate in either class or the WBIE. Students who participated only in the WBIE are more neurotic than students who participated only in class.

Table 5
Personality differences between participants and non-participants

	Classroom			WBIE		
	Participants, $N=150$	Non-participants, $N=64$	Significance	Participants, $N=34$	Non-participants, $N=155$	Significance
Neuroticism	40.05	46.76	$t(212)=2.63$**	45.42	42.14	$t(187)<1$
Agreeableness	70.15	68.48	$t(211)<1$	68.32	69.88	$t(186)<1$
Extroversion	59.43	47.89	$t(211)=4.82$**	53.02	56.23	$t(186)<1$
Conscientiousness	74.67	73.08	$t(212)<1$	74.04	74.11	$t(187)<1$
Openness	68.33	63.32	$t(212)=2.11$*	66.27	67.10	$t(187)<1$

* $p<0.05$.
** $p<0.01$.

Table 6
Personality differences between participants in different media

	Participate in class and WBIE, $N=45$	Participate only in class, $N=107$	Participate only in WBIE, $N=10$	Do not participate in class or WBIE, $N=24$	Significance, $F(3,182)$
Neuroticism	45.41	40.78	57.19	40.51	3.25*
Agreeableness	68.04	70.53	68.05	68.43	<1
Extroversion	49.56	59.06	39.82	58.52	7.18**
Conscientiousness	75.39	74.24	69.72	75.84	<1
Openness	64.07	68.03	61.83	68.12	<1

* $p<0.05$.
** $p<0.01$.

4.5. Personality differences: willingness to participate and actual participation in class and WBIE

It has already been shown that there is strong relationship between willingness to participate in class and actual participation, whereas in the WBIE, this relation is weak. There are four groups of students: students who wanted to participate and did so, students who wanted to participate but did not, students who did not want to participate but did, and students who did not want to participate and did not. We tested the personality differences between these four groups of students separately for classroom and WBIE behavior.

The personality differences between the four groups according to their classroom behavior are presented in Table 7. Significant differences were found for neuroticism and extroversion. Schaffe's post-hoc tests revealed that students who wanted to participate and did so are more extroverted than students who did not want to participate and did not. In addition, students who did not want to participate and did not are more neurotic than students who wanted to participate and did so, or than students who did not want to participate but nevertheless did so.

The personality differences between these four groups were similarly analyzed for their WBIE behavior. A significant difference was observed only for neuroticism. Students who did not want to post messages but nevertheless did so ($N=21$) are more neurotic (mean: 54.02) than students who wanted to post and did so (mean: 31.52, $N=13$), as well as than students who did not want to write and did not (mean: 41.71, $N=144$) or those who did not post messages despite wanting to do so (mean: 48.78, $N=10$).

Table 7
Personality differences between four groups of participants in class

	Wanted to participate and did so, $N=133$	Did not want to participate but participated, $N=17$	Wanted to participate but did not, $N=17$	Did not want to participate and did not, $N=46$	Significance, $F(3,209)$
Neuroticism	40.75	34.58	40.81	49.16	3.93**
Agreeableness	70.47	67.65	68.01	68.65	<1
Extroversion	59.98	55.15	50.06	47.09	8.33***
Conscientiousness	74.90	72.88	75.16	73.36	<1
Openness	68.17	69.86	67.53	60.97	2.06*

* $p=0.1$.
** $p<0.01$.
*** $p<0.001$.

5. Discussion

The present study attempted to explore the relationships between class participation and WBIE participation, as well as personality factors reflected in participation in these two educational environments. A clear difference between the two environments in terms of participation was observed. Students wanted to and actually participated in class much more than in WBIE. Some personality differences between participants and non-participants were found; particularly, classroom participants were characterized as extroverts and non-participants as neurotic.

The first research question was whether there is any relationship between classroom participation and WBIE participation. Such a relation was not observed. The majority of students participated exclusively in class or not at all. A small number of students participated in both environments, and an even smaller number of students participated only in WBIE. This result suggests that social participation is context dependent rather than a unified construct. Students may feel that one environment is better for them, they may feel more comfortable using it, thus want to participate, and perhaps do so. At the same time, the other environment may be perceived as uninviting. As we showed and will discuss below, individual differences, and particularly personality traits, may explain at least part of this finding.

Concerning the second research question, it was found that *media* affected the implementation of willingness to participate. First, the "baseline" of the willingness to participate was remarkably different: Most students wanted to participate in class while only a small number of students reported wanting to participate in the WBIE. Studies have shown that students are often more willing to participate in educational discussions online than in the classroom (e.g., Hudson & Bruckman, 2002, 2004). A key difference between these reports and the current one may be the technology used. Hudson and Bruckman (2002) used synchronous online conferencing while the online environment studied here was asynchronous. Another difference may be the academic domain: Hudson and Bruckman explored students' behavior in a foreign language course where students may value active participation, whereas this may not be the case for other courses.

Secondly, and more important, of those students who wanted to participate in class, only small number of students actually avoided doing so, whereas in the WBIE, most of the students who wanted to post messages, in fact did not do so. A possible explanation for this pattern may be the instructional medium. The WBIE may inhibit participation, while the classroom atmosphere may enhance it. Several attributes of WBIE are especially important: First, the permanent nature of written communication. What was posted cannot be corrected or deleted by the sender; therefore students may avoid posting on the course forum in order not to be considered "stupid". Second, the asynchronous nature of the medium may also contribute to students' avoidance. If the response or the feedback is delayed, other media may better serve the students needs (Gorsky, Caspi, & Tuvi-Arad, 2004). Finally, written communication may be problematic for some students, since it requires better technological as well as more adequate expression skills. In contrast, the classroom atmosphere may enhance participation, either thanks to the instructor's encouragement or by the mechanism of social comparison that may result in higher self-esteem (when the student realizes that she is not the only one who misunderstood).

Our third research question attempted to explore the personality roots of the willingness to participate in the two different environments. Differences in extroversion and neuroticism were found in actual participation in class, whereas in the WBIE, a difference was found only for neuroticism. Extroverted students wanted to participate in class and did so. In contrast, in the WBIE, the group that wanted to

participate and actually participated was not characterized as extroverted. It has been claimed that a Web-based communication environment is suitable for introverts (Amichai-Hamburger, Winapel, & Fox, 2002). We would therefore expect that the 'wanted to and participated' group in WBIE would be characterized as introverted. And indeed, students who participated only in WBIE are characterized as introverted and neurotic (see Table 6). However, when it comes to the will–execute relation, these personality traits played no role.

In the classroom, neurotic students did not want to participate and in fact did not, while in WBIE, neurotic students did not want to post messages but nevertheless did so. Here again, a strong impact of the environment is observed. It is speculated that some features of the forum break down neurotic students' resistance to participation in order to support their learning. For example, the asynchronous nature of the forum may elicit anxiety if questions are not answered or not even posted.

Our last research question asked whether classroom participants and non-participants differed in their personality traits. Classroom participants were higher in extroversion and openness and lower in neuroticism relative to non-participants. Concerning extroversion, the present results are in line with Furnham and Medhurst (1995) who reported that extroversion is positively correlated with participation in class, and in disagreement with Furnham et al. (2002) who found significant correlations between class behavior and conscientiousness as well as with agreeableness. Interestingly, in our study, participants and non-participants did not differ in conscientiousness, which is generally correlated with academic performance. If indeed class participation contributes significantly to academic performance, as many instructional and learning theories have suggested, it is expected that participants and non-participants will differ in conscientiousness. However, if class participation is merely a manifestation of high extroversion and low neuroticism, the contribution of class participation to academic performance may not be strong, or at least there may not be a direct relationship. The design and results of the present research do not afford a clear answer to this question. Participants and non-participants in the WBIE were not distinguished by any of the five factors of personality, contrary to research results in non-academic contexts which emphasized the advantage of Internet environment for introverts (Amichai-Hamburger et al., 2002). While for WBIE participants and non-participants this result was not obtained, it was found when students' participation in WBIE was divided into participation only in WBIE and participation in WBIE as well as in class. Thus, it is not introversion that caused students to avoid participation in WBIE. On the contrary, introverts found this environment "safer" than the classroom for asking questions or expressing their thoughts, thus supporting the findings of Amichai-Hamburger and his colleagues (2002).

The current study revealed that there are significant differences in participation between the two environments. Since there was no correlation between actual participation in one environment and actual participation in the other, we conclude that the environment influenced students' participation, either because of structural or psychological differences. Moreover, different patterns of relations between willingness to participate and actual participation, as well as the relation between Big Five factors, willingness to participate and actual participation, when tested within each environment, support this claim. Contrary to the report of Marks (2000) that differences between students rather than differences between classes were responsible for the majority of variability in participation, in the current study personality differences, when found, played a secondary role in the determination of students' participation. Future studies may disclose what factors in each environment are responsible for students' participation.

Appendix A

	Classroom section	WBIE section
1.	How many tutorial sessions did you attend? a. all of them b. most of them c. a few of them d. none of them	How often did you enter the course forum? a. at least once a week b. about every two weeks c. less than every two weeks
2.	Active participation in tutorial sessions includes activities such as asking questions, answering the tutor's or a student's questions, commenting, etc. Active participation does **not** include private conversations with your neighbor. Choose the sentence that is most true for you: a. I never want to actively participate in class. b. I almost never want to actively participate in class. c. I usually don't want to actively participate in class. d. I often want to actively participate in class. e. I almost always want to actively participate in class. f. I always want to actively participate in class.	Choose the sentence that is most true for you: a. I never want to post a message in the course forum. b. I almost never want to post a message in the course forum. c. I usually don't want to post a message in the course forum. d. I often want to post a message in the course forum. e. I almost always want to post a message in the course forum. f. I always want to post a message in the course forum.
3.	When you want to actively participate in class, you: a. always participate. b. often participate. c. often do not participate. d. never participate.	When you want to post a message in the course forum, you: a. always post one. b. often post one. c. often do not post one. d. never post one.
4.	Attending tutorial sessions involves mainly listening and some active participation. Did you actively participate in one of the tutorial sessions during the last three weeks? a. yes. b. no.	Participation in forums involves mainly reading other's messages and some posting of messages. Did you post a message in the course forum during the last three weeks? a. yes. b. no.
5.	If you did participate, please estimate how many times you did so.	If you did post messages, please estimate how many times you did so.

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