Higher Education Student Satisfaction and Success in Online Learning: An Ecological Perspective

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This study examined Jewish and Arab graduate students` satisfaction and success in an asynchronous online course (OC) in Israel, analyzing the correlations between student characteristics/background, design features and learning outcomes. Guided by Bronfenbrener`s ecological model, the study employed quantitative and qualitative approaches. 174 students studying for master's degrees in education at a college in central Israel participated in the research, responding to a specially constructed online questionnaire as well as 12 semi- structured interviews. Additionally, the grades received by the students for their course assignments were analysed. Quantitative data analysis found: 1. Students` technological self-efficacy (TSE) predicts a correlation between intrinsic motivation and OC satisfaction. 2. The variables that predict the students' satisfaction with the OC: positive perception of the course assignments as understandable and useful; effectiveness of the learning process and good quality of communication with the lecturer. 3. The sector variable (Arab / Jewish) was found to moderate the correlation of the Jewish students' (JS) and Arab students' (AS) final grades with a contribution from various means of learning. Thus, when AS felt that they received a contribution from the use of more learning means, they achieved higher grades. The AS found it difficult to adapt to the independent learning style needed for the OC. Qualitative data, gathered from the open-ended questions and interviews with the students` were triangulated, reinforcing findings and explaining the quantitative data. Findings revealed three categories described the differences in satisfaction between the JS and AS throughout the course: Learners' attitude toward a course built from assignments, learning independently, Contacting the lecturer for assistance. Theoretical and practical implications are noted.

Keywords: online learning, jewish and arab students, asynchronous course, students' satisfaction, technological self-efficacy, higher education

INTRODUCTION

Internet technologies have significantly changed the field of distance education in higher education institutions (Bates, 2019) and the number of Online Learning (OL) courses in academic institutions has increased significantly (Wei & Chou, 2020). These courses are influenced by the constructivist approach to education (Reid-Martinez & Grooms, 2018) and enable different types of teaching through the use of asynchronous and synchronous tools (Mantasiah et al., 2021; Masry-Herzallah, 2022a). Many studies have explored factors that promote or hinder success in OL (e.g., Bolliger & Halupa, 2018; Shelton et al., 2017) and investigated critical factors influencing learner satisfaction in an OL environment.

Previous studies have found that students' satisfaction and success in OL are influenced by their characteristics and students background (personality traits) such as technological self-efficacy (TSE) (Masry-Herzallah, 2022a). Students' satisfaction and success are also influenced by Online Course (OC) factors such as: course structure, type of technologies in the course, lecturer characteristics (Eichelberger & Ngo, 2018; Nortvig et al. 2018), and the nature of the lecturer-student interaction (Masry-Herzallah, 2022b).

Likewise, student outcomes (success) in OCs are affected by socio- economic factors (e.g., insufficient ICT infrastructure, lack of adequate Internet connectivity, lack of educational material and content), as well as socio-cultural factors (national, gender, traditional etc.), and values as they affect learning perceptions and teaching processes in the online space (Bolliger & Halupa, 2018; Masry-Herzallah & Stavissky, 2021b; Walabe, 2020).

Some scholars have recently suggested that various aspects of online students` success are related to a complex ecological context (Sangrá et al., 2019). Bronfenbrenner's (1979) ecology of human development model can be applied to current conceptualizations of human development and learning. His "eco-social systems model' theorizes that human development and learning are influenced by interactions in different social and societal settings, from the micro- and meso- to macro-levels of contexts. It is possible to characterize OL as interactions at multiple social and societal levels, from the micro- to macro-levels in line with Bronfenbrenner's ecological theory.

The present research was carried out in accordance with the ecological approach of Bronfenbrenner (1979) and examined OL while referring to both the immediate environment of the individual and the influence of the wider society. Studies in other countries have shown that socio-cultural characteristics influence student satisfaction and success in OL (Sangrá et al., 2019; Walabe, 2020). However, OL has not been a subject of research in Israel, which characterize with a mosaic of cultures (Masry-Herzallah, 2021). Thus, the present study contributes to the understanding of the influence of students` satisfaction and success in OL in higher education institutions, characterized by multiculturalism.

The influence of cultural characteristics is most relevant in Israel due to the unique characteristics that distinguish Jewish students (JS) from Arab students (AS) and the

difference in difficulties that may arise during OC (Masry-Herzallah, 2022a). Israeli society consists of a mosaic of cultures, each divided into various groups. The most prominent division is between Jewish and Arab society, expressed in different religions, language, residential environments, cultural characteristics and national aspirations (Masry-Herzallah & Arar, 2019). In Israel's higher education system, JS and AS study side by side. The study described here assumed that the above-mentioned differences have implications for the functioning of the education system and for students and educators' perceptions of the effectiveness of OL, and their success in learning in this environment. For example: the low academic level of Arab public schools due especially to under-budgeting for schools in Arab localities and the cultural gap between the two populations leave AS with a significant disadvantage when beginning their studies at Israeli academic institutions compared to the JS's starting point (Masry-Herzallah, 2022a; Zisberg, 2018). Moreover, since studies at most Israeli academic institutions are delivered in Hebrew, while the AS's mother tongue is Arabic, they face a language gap that impairs their academic achievements (Masry-Herzallah & Cohen, 2023). This study therefore examined the satisfaction and success of both Arab students and Jewish students in an asynchronous OL course environment, analysing the correlations between student characteristics/background, design features and learning outcomes, with reference to the dimensions of Jewish and Arab socio-cultural characteristics in Israel.

The study combined quantitative with qualitative data derived from questionnaires and from semi-structured interviews. The rationale for conducting mixed-methods research stemmed from a desire to explain the quantitative data and to understand how the students explained their OL experiences.

The study findings have implications for education policy and practice in various countries that are characterized by multicultural societies and thus can inform practice in other multicultural societies.

The study answered the following questions:
1. Which factors/ variables (students' personality traits, OL factors, lecturer factors) predict the students` satisfaction in OL?
2. Which factors (variables) predict academic success (grades) in OL in general? Is the prediction different for JS or AS and how can these differences be explained?
3. Which factors are perceived by JS and AS as promoting or inhibiting their success in OL?

Literature Review

OL is conducted through various Internet tools and technologies using both synchronous and asynchronous methods (Mantasiah et al., 2021; Masry-Herzallah, 2022a). Synchronous learning uses technological tools that enable distance learning, but the lecturers and students attend the lesson at the same time, facilitating greater interaction between participants (Burdina et al., 2019). In asynchronous learning, technology connects various students with lecturers without specifying a particular shared time and place in order to conduct learning activities. Asynchronous tasks aim to promote students` independent learning. The lecturer's role in asynchronous learning is to offer

guidance for students' independent learning and provide "scaffolding" to support that learning (Masry-Herzallah, 2022a; Shamir-Inbal & Blau, 2021).

OL offers students many benefits, such as: flexible schedules, eliminating time invested in changing physical location, stimulating interaction between students and lecturers, reducing stress and strain in the learning process (David et al., 2023; Eichelberger & Ngo, 2018). Furthermore, OL provides lecturers with the opportunity to integrate various virtual means of instruction in the learning process, such as video files, tutorials, and links to additional resources (Bolliger & Wasilik, 2009). However, OL may have disadvantages for students, such as a sense of loneliness, adjustment difficulties, self-discipline difficulties, a requirement for good time management and independent learning (Shamir-Inbal & Blau, 2021).

Students' satisfaction and success in an OL

It is possible to use elements from Bronfenbrenner's ecological theory to analyse the student's satisfaction and success in OL in higher education. The present analysis uses three levels of Bronfenbrenner's ecological theory. One is the microsystem' level, which includes the factors influencing the individual's immediate environment. The second is the mesosystem level which include organizational factors influencing the OL: environment, communication with fellow students and lecturers. Other is the 'macrosystem' level of analysis, which includes the interplay of settings in the wider society (Bronfenbrenner, 1979). The ecological perspective perceives students as being at the centre of the OL process (e.g., home, educational, work, and virtual). As the student moves between locations, the transactional relationship between the student and the context changes (Terras & Ramsay, 2012). Applying an ecological approach to student experience of OL in higher education, enables the rethinking of 'new' and 'traditional' technological means and related learning and socio-cultural practices in their educational context as a place "in which new and old entities find ways of coexisting" (Ellis & Goodyear, 2009, p. 17).

Micro-system factors affecting OL

Bronfenbrenner's ecological theory (1979) provides special attention to understanding students' beliefs, preferences, and goals as primary factors influencing the OL. Previous studies indicate a positive correlation between a student's personality variables (internal-individual factors) and satisfaction in an OL (Hong et al., 2021). These include a student` technical skills and abilities (Shelton et al., 2017); student's self-efficacy, and motivation (Bandura, 1977; Amzaleg & Masry-Herzallah, 2021; Zhao et al., 2021).

As explained by Bandura's Social Cognitive Theory (Bandura, 1977), self-efficacy provides a set of practices for the route to academic achievement in OL environments and is a necessary basic condition for intrinsic motivation and performing high-level complex tasks (Deci & Ryan, 2000). Motivation to engage in OL plays an important role in OL academic achievement and satisfaction (Deci & Ryan, 1985; Torun et al., 2020).

TSE refers to knowledge of a varied set of tools and technological resources employed to exchange, create, disseminate, store, and manage information (Chi et al., 2020).

When students have a strong sense of TSE this improves their performance in OC and information retrieval. For example, it was found that students with high TSE received higher scores on tests than students with low TSE (Chang et. al., 2014). These findings can be explained by the positive effect of self-efficacy on motivation and TSE to perform OL tasks (Masry-Herzallah, 2022).

Meso-system factors influencing OL

From an ecological perspective, student attitude and satisfaction in OL is highly influenced by their interaction with the learning environment (Reschly et al., 2020). The organizational context including provision of effective guidance, support, and instruction to students has been found to have a major impact on students' success in OL courses (Tang et al., 2016). Likewise, student success was found to be influenced by the existence of diverse teaching methods, student participation in activities, a collaborative learning environment that allows flexibility in time (Yuliyatno et al., 2019) and beneficial lecturer-student interaction (Utama, 2018). Students who interact more frequently with the lecturer demonstrate a higher level of satisfaction (Shelton et al., 2017), and frequent student-teacher interaction and lecturers' conduct during OCs correlated with students' sense of satisfaction (Eichelberger & Ngo 2018). In this context, lecturers' technological skills, teaching style, interaction with the learners and lecturers' knowledge in their field of specialization had a major influence on the students' sense of satisfaction (Masry-Herzallah & Stavissky, 2021a; Song et al., 2019). Conversely, dissatisfaction within OL was found to correlate with technological difficulties and inadequate group participation by peers (Masry-Herzallah & Stavissky, 2022). Another factor that may influence the effectiveness of OL is the interaction between the students in the course. Student satisfaction in OL was found to be related to good inter-student communication and a sense of partnership during the course (Amzaleg & Masry-Herzallah, 2021). Previous studies found that poor social presence can lead to poor outcomes and insignificant learning experiences (Masry-Herzallah, 2022a). To encourage an interactive online environment, the course content should be easily accessible and relevant for the students (Barberà et al., 2016).

Macrosystem factors influencing OL

Using technology in education is a complex issue, necessitating attention to cultural, social, and socioeconomic factors (Bolliger & Wasilik, 2009; Masry-Herzallah & Stavissky, 2021b; Williamson et al., 2020). OL is influenced by many contextual factors (Masry-Herzallah, 2022; Walabe, 2020) and including sociocultural characteristics, such as the political and social environment; structural characteristics, such as the university context and student background; and psychosocial characteristics, such as the teaching environment, teacher-student relationships and student motivation (Torun et al., 2020; Zhao et al., 2021). Previous studies have found that cultural aspects may be an important influence on students' success in OL and that students' cultural background and personal history have a significant impact on how they learn and interact in OCs (Bolliger & Halupa, 2018; Masry-Herzallah & Stavissky, 2021b).

A major socio-cultural difference between the Jewish and Arab society in Israel is that Jewish society is largely individualist while Arab society is characterized as collectivist, (Masry-Herzallah & Stavissky, 2021b). This distinction may be a significant influence for OL success, because OL requires active involvement of students, participating and demonstrating individual initiative in the course. In individualistic cultures, students are characterized by greater participation and involvement during the lessons; while in collectivist cultures students emphasize respect for the teachers' knowledge and are characterized by restraint (Hofstede, 1980). Hence, students from a collectivist culture may find it difficult to become involved, participate and take the initiative as often required in OL (Amzaleg & Masry-Herzallah, 2021; Hamdan, 2014).

In addition, in collectivist cultures, teachers are highly respected and perceived as having undoubted authority stemming from their knowledge and status. Accordingly, students rarely contact the lecturers to ask them questions and get help. For example, a study conducted on OL among students in Saudi Arabia found that OL promoted the conditions for change in the learning culture. It was found that the pedagogical process had changed and the students developed critical thinking and self-directed learning and the course promoted more social interaction (Hamdan, 2014).

Difficulties of Arab students in Israel's academia

AS study in a separate Arab education system until the end of high school and only encounter the general curriculum when they enter university or college. The Israeli education system is characterized by social, economic and cultural inequality between different groups of students, especially evident between JS and AS. Previous research indicates that the Arab education system is influenced by the collectivist characteristics of Arab society. Arab schools follow a traditional frontal teacher-centered teaching system positioning the student at the margins in the learning process (Masry-Herzallah & Arar, 2019). Standard national and international tests at school indicate achievement gaps between different groups of students, higher than gaps of this kind in other OECD states. Achievement gaps are also evident between JS and AS in academia (Masry-Herzallah & Cohen, 2023). In the Arab education system, most students are not exposed to technological means, so in addition to learning difficulties, they also have to deal with a lack of computer skills (Masry-Herzallah & Stavissky, 2021a).

The sharp transition to academia, where studies are delivered in Hebrew, alienates AS and causes difficulties in their integration. AS have to deal with many complex academic challenges, in an environment that presents an unfamiliar culture, social scene and values (Masry-Herzallah, 2021). Arab education in Israel rarely focuses on critical and independent thinking and AS consequently find it difficult to cope with academia's prevalent patterns of conduct, which is characterized by self-direction, searching and reading materials and writing papers independently and self-reliance ((Masry-Herzallah & Amzaleg, 2021).

Thus, AS often lack the necessary self-esteem for success in academia. Insofar as their self-esteem is lower and their fear of failure is greater, then they will have lower academic aspirations (Amzaleg & Masry-Herzallah, 2021). Previous studies have found

that ethnicity is a decisive factor advantaging the sense of success of JS compared to AS, and those environmental and cultural factors have an impact on the lesser success of AS in academia (Masry-Herzallah, 2021). Consequently, this research assumed that AS' satisfaction and success in an OL will be lower than that of JS.

METHOD

The study context

Online course description

The course entitled *"Planning in education"* focuses on "planning and implementation of policies in different education areas in Israel, out of the goal to help learners to understand the processes of planning and implementation of education policies. (from the course syllabus). The course learning materials were divided into five study units and were available on the course website. All lessons were filmed on screencast, software permitting combination of a presentation (PowerPoint slides), and recorded video lessons. These lessons are short and focused (each lasting about 10 minutes) and were recorded in Hebrew. The lecture was uploaded to the course website along with presentations, videos, audio and other learning materials. The short video and audio recordings explained the conduct of the course and the course obligations including explanations of the assignments and the topic studied in each unit.

The course lecturer, who is the first author of this article, was accessible to the students and supported them both online and with electronic mail. Questions to the lecturer were answered on the course site and also offline: meetings during reception hours in the college or in telephone conversations. Additionally, there were three face-to-face meetings with the lecturer per semester. The students were informed that they did not need to make an appointment with the lecturer but should come only if they felt they needed to meet. This strategy has two advantages: the lecturer provides a possibility for support outside online support and, this is a flexible solution – allowing flexible times for a meeting and flexibility due to the very possibility of a meeting itself. In other words, the student can avoid an individual meeting with the lecturer if they prefer, while preserving the flexibility enabled by the OC. In the individual meetings, instruction is performed in Hebrew or Arabic, according to the student's convenience since the course lecturer speaks both languages fluently. During the course, the students were asked to present five assignments. Calculation of the grades for the five assignments constituted 100% of the final grade.

Study design

The study adopted a mixed methods approach, which enabled the exposure of contextual information on the participants' experiences. In the first stage, the study included collection of quantitative data through questionnaires and in the second stage included the collection of qualitative data from interviews (Creswell, 2014). The qualitative research aims to explain the findings of the quantitative research, to improve the understanding of the correlation between the variables and the context of the statistical results (Q3). In doing so, a triangulation was carried out between the quantitative

findings that provided an illustration of the students' experiences in studying in OC and the findings of the qualitative research. Thus, a social constructivist viewpoint emerged from the research analysis of the JS and AS narratives about their different OL experiences.

Participants

The research participants were students who studied the above-mentioned course, as part of their master's degree programme in an education college in Israel (N=174). Data were collected through August and until September 2019. Five assignments were given during the course, the grades for three assignments were given before the students filled in the questionnaire and grades for the last two assignments were published after filling in the questionnaire. 75% were women and 25% men.73% were Jewish and 27% Arabs. Average age was 39 (SD = 8.14), average number of formal education years was 13.5 years (SD = 7.76). 74% reported that this was their first OC.

After deriving descriptive statistics from analysis of the questionnaire responses, the study proceeded with semi-structured interviews with 12 students (6 Jews and 6 Arabs). The semi-structured interview, composed of open and focused questions, helped the interviewees expose their stories and their meanings for their narratives openly and ensured the unity of the interview themes. The researchers found the participants through random sampling. The examinees' ages ranged between 32-48. To protect their confidentiality, the 12 students were labelled as students 1 to 12 without revealing their identities (See Table 1).

Table 1
Students' characteristics

	Gender	Sector	Age
1	Female	Arab	33
2	Female	Arab	38
3	Female	Arab	42
4	Female	Jewish	48
5	Female	Jewish	34
6	Female	Jewish	44
7	Male	Jewish	45
8	Male	Jewish	35
9	Male	Jewish	40
10	Male	Arab	40
11	Male	Arab	32
12	Male	Arab	38

Measures

Research tools

The study combined quantitative with qualitative research. A questionnaire was prepared specially for the research to elicit students' satisfaction towards the pedagogy of teaching in the OC. The questionnaire was composed in Hebrew. Before it was distributed to the entire research population, a pilot study was conducted with twenty

students in order to ensure that the items were clear, and answers would respond to the research questions. Most of the questionnaire items were in the form of closed statements and the respondents were asked to mark the extent to which they agreed with each statement on a 5-point Likert scale ranging from 1 – not at all to 5 – to a large extent. More specifically, the questionnaire included items gathering attitudes and satisfactions towards the pedagogic and techno-pedagogic structure of the course (for example: "presentations, reading materials, recorded lectures etc.); students' satisfaction concerning the course structure (for example: "the course structure and requirements were clear to me"), communication with the course lecturer (for example: "I received a response to my requests from the lecturer"), general satisfaction concerning the course (for example: "the course was interesting"), effectiveness of the learning process (for example: "through this method I understood the learning materials"), students` self-efficacy and motivation; possible difficulties in an OC (e.g." Difficulty finding time to work on assignments", "meeting schedules") and more. The open-ended questions students detailed the difficulties they encountered in the course aspects they liked in the course (course content, lecturer role, student role, teaching methods (three aspects with examples), course aspects requiring improvement. The questionnaire also included a part asking for demographic details for example the participant's nationality, gender etc.

The questions in the interview focused on students' learning experience in the course such as "tell us about your learning experience in the course? What are the advantages of the OC? Disadvantages? Contribution of the course to your work at school and your difficulties? Did you consult the course lecturer? Describe the elements that you think are important in promoting learning in the course; tell us about the difficulties you faced in the course? What are the factors that influenced the grade in the course? Were the assignments in the course effective?

Procedure

The study received the approval of the Ethics Committee at the academic institution where data were collected. Students in the course were then informed about the study and invited to participate. They were also asked to consent to the disclosure of their end of semester academic achievements, and told that this information would be stored anonymously, for research purposes only.

After the OC ended, the students were sent a link to the Google Form questionnaire through the course site. During the research ethical rules were carefully maintained, the students were promised anonymity in any publication of the research. The questionnaire's purpose was explained to the students. Since the first author was the course lecturer, the students were informed that the questionnaire would be completed anonymously and voluntarily, and their questionnaire responses would have no influence on the grades given for the assignments or the final course grade. Two weeks after distribution of the questionnaires, a reminder was sent to the students. The semi-structured interviews were conducted after analyzing the questionnaire responses. A message was sent to the students who had participated in completing the questionnaire, explaining the research process and the need to conduct interviews with several students, again promising anonymity for the interview data. After receiving their approval, the

interviews were conducted by a research assistant who speaks both Arabic and Hebrew, for approximately 45 minutes. To avoid social desirability, the interviewer avoided exposure of his personal perceptions and was careful not to express judgmental or moral responses to the participants' remarks. Both qualitative and quantitative analyses were employed. The results of the survey questionnaire were analyzed quantitatively using SPSS software, deriving descriptive statistics, and testing correlations between the research variables. Students' final course grades were analyzed through a Bootstrapping sample, hierarchical regression, and simple linear regressions. Qualitative analysis was applied to the interview transcripts and the responses to the open-ended questions in the questionnaire, using content analysis in stages (Creswell, 2014). During the analysis, open coding was performed, and super-categories were determined, reflecting the main emergent conceptions, which were broken down in a further coding process into sub-categories (Marshall & Rossman, 2014). These categories are presented respectively alongside the quantitative findings, noting correlations between them.

FINDINGS

Quantitative findings

Several research variables were calculated. The list of variables, their means and internal reliability according to Cronbach's alpha were also calculated, as shown in Table 2.

Table 2

Values for means, SD and internal reliability of the research variables

Variable	Possible range	Mean	SD	α
Lecturer's role in OC	5-1	4.17	0.64	.70
Course contents' contribution	5-1	4.09	0.85	.86
Number of learning means	9-0	3.16	2.38	-
Satisfaction regarding assignments	5-1	4.09	0.68	.84
Course structure	5-1	4.32	0.57	.84
Communication with the lecturer	5-1	4.18	0.92	.79
Satisfaction regarding the course	5-1	4.03	0.68	.84
Effectiveness of learning process	5-1	4.24	0.54	.81
Self-efficacy for learning	7-1	5.37	0.84	.78
Extrinsic motivation	7-1	4.90	1.01	.60
Intrinsic motivation	7-1	5.39	1.06	.85
Difficulties	5-1	2.13	0.82	.85
Course grade	100-1	89.85	6.11	-

Note: Possible range=1-5, apart from the course grade which ranges from 1-100

From Table 2 it is clear that there is strong satisfaction regarding the course and regarding the lecturer. It was found that most of the variables had very good internal reliability according to Cronbach's alpha. Next, Pearson correlations were calculated between these variables, and between the reports about extent of TSE and the final course grade, Table 3 shows the matrix of the correlations that were found.

Table 3
Correlations between the research variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Lecturer's role in OC	-	.27	.01	.28	.31	.19	.21	.16	.21	.18	.22	-.34	.02	.10
Course contents' contribution	-	-	.40	.34	.35	.30	.30	.29	.26	.15	.35	-.20	.01	-.08
Number of learning means	-	-	-	.15	.20	.24	.04	.14	.08	.02	.09	-.16	-.05	.07
Satisfaction regarding assignments	-	-	-	-	.74	.45	.75	.66	.64	.32	.60	-.49	.19	.01
Course structure	-	-	-	-	-	.33	.61	.59	.55	.35	.56	-.47	.10	.03
Communication with the lecturer	-	-	-	-	-	-	.47	.30	.30	.16	.29	-.22	.06	-.15
Satisfaction regarding the course	-	-	-	-	-	-	-	.68	.64	.39	.66	-.37	.17	.00
Effectiveness of learning process	-	-	-	-	-	-	-	-	.64	.27	.62	-.39	.25	.03
Self-efficacy for learning	-	-	-	-	-	-	-	-	-	.48	.77	-.45	.22	.07
Extrinsic motivation	-	-	-	-	-	-	-	-	-	-	.57	.00	.00	.00
Intrinsic motivation	-	-	-	-	-	-	-	-	-	-	-	-.38	.11	.09
Difficulties	-	-	-	-	-	-	-	-	-	-	-	-	-.26	-.12
Course grade	-	-	-	-	-	-	-	-	-	-	-	-	-	.07

Note: Correlations higher than 0.15 were significant at a level of $p<0.05$ and correlations greater than 0.19 were significant at a level of $p<0.01$.

As can be seen in Table 3, many correlations were found between the various research variables, some very high. Nevertheless, no statistically significant link was found between the research variables and the final course grade.

At the next stage, the examination was deepened and using regressions it was decided to test the prediction ability of one variable relating to personal characteristics, one variable relating to the course and the final course grade. Out of the examined personal characteristics, it was decided to go deeper into the predictive ability of the students' intrinsic motivation to learn. This variable was chosen since research had shown that without intrinsic motivation for studies on the course, the student could not succeed academically and derive the optimal benefits from the course. The variable chosen from the course characteristics was students' satisfaction with the course. This variable was selected out of the assumption that it constituted a sort of summarizing variable, representing the student's attitude towards the course and its contribution to their needs and general opinions concerning the course.

Regression was performed using the bootstrapping technique with 1,000 repetitions. According to this accepted strategy, when the values do not include 0 in confidence intervals, the result is significant. The values appearing in the confidence interval express the beta values (β) with a confidence level of 95%. The first regression tested was the prediction by intrinsic motivation. At the first stage of the regression the mean grade for the course was introduced and TSE, and at the second stage the predicting variables were introduced. The variables course grade and extent of TSE were introduced into the model at the first stage because theoretically there was a desire to test the predictive influence on the predicted while removing these two variables, and

also because the extent of TSE was found to be correlate with most of the research variables. The predicting variables which were included in the second stage were the lecturer's role in the course, contribution of course components, satisfaction concerning the assignments and self-efficacy for learning. The model in its entirety was found to be significant F(6,150) ?=49.75, p<.001, and explains approximately 67% of the variance in the predicting variable. Adding predicting variables in the second stage improved the model in a statistically significant manner (see Table 4).

Table 4
Hierarchic regression to predict intrinsic motivation

Variable	VIF	CIL	CIU	SE	F	F change
Stage 1						
Course grade	1.01	0.00	0.07	0.02		
Technological Self-efficacy	1.01	-0.07	0.37	0.11		
R^2	.05				4.16*	
Stage 2						
Course grade	1.14	-.03	0.01	0.01		
Technological Self-efficacy	1.05	-0.18	0.09	0.07		
Importance of the lecturer	1.15	-0.15	0.25	0.10		
Course components contribution	1.23	-0.03	0.30	0.08		
Satisfaction regarding assignments	2.06	-0.03	0.77	0.20		
Self-efficacy	1.87	0.67	1.02	0.09		
R^2	.67				68.88**	49.75**

Note: * *p*<.05, ** *p*<.01; VIF = Variance Inflation Factor; CIL=Confidence Interval Lower; CIU=Confidence Interval Upper; SE= Standard Error

The data in Table 4 indicates that the model is significant, adding the variables in the second stage improved the model significantly and made it possible to negate multicollinearity (a multicollinearity problem can be negated when VIF is lower than 5). On the other hand, the strongest predictor was self-efficacy, so that insofar as a male or female student reports stronger self-efficacy to learn, then they report stronger intrinsic motivation to learn. Satisfaction regarding course assignments marginally predicted intrinsic motivation to learn, such that insofar as a male or female student reported more satisfaction concerning the course assignments, then they also reported stronger intrinsic motivation to learn.

An additional hierarchic regression model was performed in order to predict students' satisfaction concerning the course. After introducing the variables course grade and technological self-efficacy, at the second stage the predicting variables contribution of the course components, course structure, communication with the lecturer, effectiveness pf the learning process and contribution of the course assignments were included. 35 respondents were not included in this analysis because they reported that they had had no contact with the course lecturer (and so no grade was calculated for them for communication with the lecturer). The model in its entirety was found to be significant, F(7,120)=35.09, p<.001, and explains approximately 67% of the variance of the predicting variable. Addition of the predicting variables in the second stage significantly improved the model statistically (see results in Table 5).

Table 5
Hierarchic regression to predict satisfaction

Variable	VIF	CIL	CIU	SE	F	F change
Stage 1						
Course grade	1.02	0.01	0.06	0.01		
Technological self-efficacy	1.01	-0.05	0.26	0.08		
R^2	.08				6.42**	
Stage 2						
Course grade	1.18	-.02	0.01	0.01		
Technological Self-efficacy	1.01	-0.13	0.10	0.06		
Course components contribution	1.24	-0.12	0.11	0.06		
Course structure	2.42	-0.24	0.24	0.01		
Communication with the lecturer	1.30	0.01	0.26	0.06		
Effectiveness of the learning process	2.06	0.13	0.64	0.13		
Satisfaction concerning course assignments	3.23	0.45	1.02	0.14		
R^2	.67				35.08**	42.31**

Note: * $p<.05$, ** $p<.01$; VIF = Variance Inflation Factor; CIL=Confidence Interval Lower; CIU=Confidence Interval Upper; SE= Standard Error

The data in Table 5 show that the model is significant, adding variables at the second stage improved the model significantly and it was possible to negate multicollinearity. At the second stage, the strongest predictor is the perception of the course assignments, such that insofar as the male or female student reported that the assignments given during the course were more structured and helpful, then they also reported more satisfaction regarding the course. It also emerges from the data presented in the table that the effectiveness of the learning process is the second strongest predicting variable, such that insofar as the female or male student reported greater effectiveness of the learning process, then they were also more satisfied with the course. Finally, communication with the lecturer was also found to be a significant predictor in the model, such that insofar as the male or female student reported better quality communication with the lecturer during the course, so they were also more satisfied with the course.

The course grades

As can be seen from the data in Table 3, none of the research variables had the power to predict the course grade. The demographic variables were therefore examined. It was found that the mean grade of JS on the course (M=91.20, SD-4.59) was significantly higher than that of the AS on the course (M=84.81, SD=7.86). Because the assumptions do not exist for t-tests (the course grades do not have a normal distribution and the groups are not equal in size), Mann-Whitney tests were performed, which determined that the difference was statistically significant, *u*=1094, *z*=4.27, *p*<.001. Consequently, the researchers examined whether the course characteristics play a different role in each of the groups. This time too, the variable TSE was maintained as a constant and it was examined whether the extent to which the student was helped by the different learning means employed in the course predicted the course grade, while examining whether gender moderated this correlation. The moderation model was tested using a Hayes Process supplement (Hayes, 2018). This method enables an investigation of a broad

variety of models of moderation and mediation and uses the bootstrapping technique to take a renewed sample of 1,000 repetitions. The entire model was found to be significant $F_{(4,164)}=12.20$, $p<.001$ and explains approximately 23% of the variance in the course grades. The variables interaction between the use of learning means in the course and sector was found to be marginally significant - coefficient=0.97, se=0.50, t=1.92, CI=[-0.02, 1.96]. The summary of the model can be seen in Table 6.

Table 6

Summary of the moderation model

Variable	Coefficient	SE	Boot LLCI	Boot ULCI
Technological self-efficacy	1.48	0.53	0.44	2.52
Learning means	-0.94	0.60	-2.12	0.24
Sector (Arab)	-8.93	1.62	-5.72	-12.14
Sector-learning means	0.97	0.50	-0.02	1.96

Note: Dependent variable = final course grade; Boot LLCI = Lower level of confidence interval; Boot UCLI = Upper level of confidence interval.

In order to breakdown the interaction, the correlation between the use of learning means and the course grade was examined in each sector separately. It was found that while this correlation was not statistically significant among the JS coefficient=0.03, se=0.19, t=0.15, CI=[-0.34, 0.39], it was positive and statistically significant among the AS coefficient =1.00, se=0.47, t=2.13, CI=[0.07, 1.92] (see Figure 1).
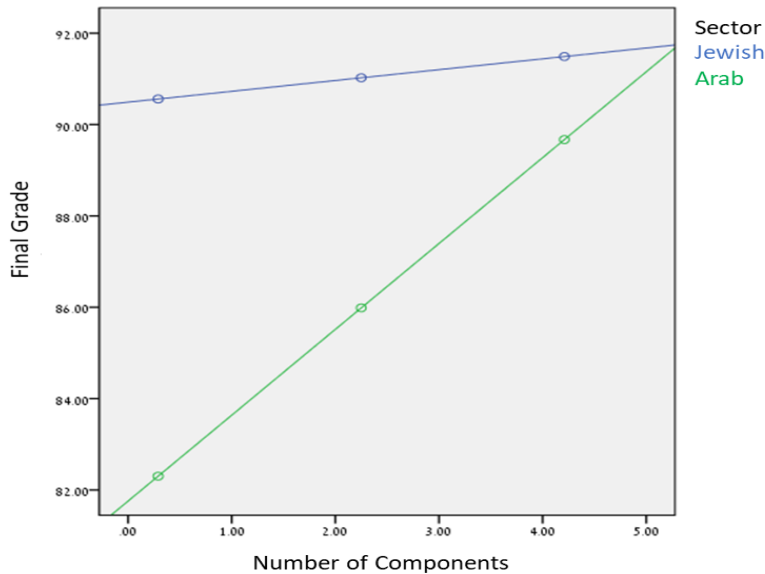

Figure 1
Interaction between the number of learning components and sector in the prediction of the final grade

As can be seen in Figure 1, when a large number of learning means are used during the course, the grades of both groups were high. Nevertheless, while the grades of the JS in the course were high even when they did not use many learning means, the grades of the AS in the course plummet when they do not exploit the different learning means provided in the course.

Analysis of the qualitative findings

To answer the fourth research question searching for an explanation for the differences between the responses of JS and AS, an open interview was conducted. The students' remarks during the interviews helped to explain the gap between the satisfaction and achievements of JS and AS concerning the OC. Three categories described the differences in satisfaction between the JS and AS throughout the course: Learners' attitude toward a course built from assignments, learning independently, Contacting the lecturer for assistance. Each of these themes are now considered separately.

Attitude toward a course built from assignments

Most of the students spoke of their satisfaction with the course as affected by their attitude to the self-management of the various tasks they performed in the course. The students were required to prepare and submit several assignments in pairs. The socio-cultural differences relating to learning methods between JS and AS were reflected in their different consideration of the requirement for self-management of course assignments. The JS emphasized the advantage of a course built from a variety of assignments and noted the positive value of flexibility in time and place. As JS explained:

This type of OC is very suitable for me as an educator and coordinator at the school, I performed the tasks at a time and place that suits me, and I enjoyed this activity (JS4).

In contrast, AS shared that it was difficult for them to take a course that consisted mostly of assignments that had to be written independently. They needed to independently follow the course requirements and guidelines within a pre-determined time frame. This difficulty was expressed by two AS:

I am used to studying in frontal courses and take a test at the end of the course. But in this course, we had to be continually active, follow the instructions and perform tasks as required. These tasks required self-discipline, and work with another partner. These requirements are not easy for me. I must admit that the course was very interesting, the teacher was excellent, available and supportive. But I had a hard time preparing five assignments in a row because I am not used to that course style. I am used to attending frontal courses in which there is a middle assignment and a final assignment or test (AS1,11).

Summary of the AS' testimony indicates that their preference for traditional evaluation methods explains their less supportive attitudes to OL and their lower grades in the OC in comparison to JS.

Learning independently

Another socio-cultural difference arose regarding the requirement for independent learning. The JS noted that the requirement to study independently reinforced group learning:

I really liked the challenge of submitting assignments independently, it made me appreciate my learning and abilities more and think outside the box. (JS9).

Learning included collaboration [between students]. Working in pairs yielded good results. The OC made us help each other as a group, ask questions and consult the group, this type of learning empowered me greatly (JS8).

However, the AS pointed out that they had difficulty coping with asynchronous learning based on self-study, without the presence of the lecturer. This type of learning was unlike the learning culture practiced in Arab schools. They noted:

Learning in an OC relies on autonomous study. Although every study unit has various learning tools that I can use to write the assignment. it is not easy for me and other AS, who are used to frontal teaching. We prefer frontal courses, where the lecturer teaches face-to-face, instead of an OC (AS2,3).

The teaching method in the OC requires me to adapt to a new teaching style, different from our usual teaching methods. The hardest part is learning on your own, taking responsibility for learning, following the lecturer's instructions and messages to succeed in the course, unfortunately it was not easy for me (AS12).

Contacting a lecturer for assistance

Another cultural difference was expressed in the sense of comfort in contacting the course lecturer for help when needed. The JS felt comfortable contacting the course lecturer while the AS felt uncomfortable to do so. The JS emphasized the easy availability of the lecturer and noted that they often approached her while writing the various course assignments, as shown in the following quotations:

The lecturer was attentive and available to meet the needs of the students. She provided an attentive and caring response (JS5-7).

The lecturer was available, patient and met expectations. She gave me confidence that she was available whenever I needed her (JS6).

In contrast, the AS indicated that they rarely approached the course lecturer even though she was always available to them as described by two AS:

During the course I hardly turned to the lecturer for help. I preferred to get help from fellow students. Sometimes I was too shy to do so because we are not used to contacting the lecturer (AS2).

I always rely on my abilities and do not turn to lecturers for help. It may not be good, but that's how we (AS) have been used to coping on our own. We probably need to educate our students to accept a different learning style so that they can cope with OL challenges (AS12).

The interviewees' testimony explains the findings from the questionnaire responses concerning the difficulties encountered by AS during the OC.

DISCUSSION

The current study has been inspired by Bronfenbrenner (1979) ecological theory and examined students` satisfaction and success in an asynchronous OC through an analysis of correlations between student characteristics/background, design features and learning outcomes (students' motivation, satisfaction and grades) on the course in a comparison between JS and AS graduates.

The research findings indicate that student satisfaction with the course is affected by both their personality traits and environmental influences. It was found that students' TSE predicts a correlation between intrinsic motivation and OC satisfaction. As for the characteristics of the course, the findings indicate that three variables predict the students' satisfaction with the OC: the perception of the assignments in the course as understandable and useful; effectiveness of the learning process and the quality of lecturer-student communication. In a comparison between JS and AS, it was found that the variable sector (Arab / Jewish) moderates the correlation between the use of diverse learning aids and the course grade. Thus, the JS final grade for the course was high even when they did not use many means of learning, while the AS final grade plunges when they do not utilize the various learning means offered by the course.

Analysis of the research findings yields several insights. First, from an ecological perspective (personal and 'microsystem' level), the current finding expands upon previous work regarding the correlation between students` TSE, motivation and satisfaction in OL. The findings of the current study highlight the great importance of TSE and motivation as student personality variables that influence their satisfaction in OL. These findings are consistent with previous studies that have indicated a positive correlation between TSE, motivation for success, and achievement in OL (Chang et al., 2014; Masry-Herzallah & Stavissky, 2021b; Masry-Herzallah, 2022b; Torun et al., 2020). Students with high TSE are likely to be more willing to use effective online instruction in their teaching as educators. Therefore, lecturers in academic institutions should be encouraged to identify student characteristics in an OC in order to give appropriate support to their learning processes. TSE and initiative, along with intrinsic and extrinsic motivation, are significant predictors of the student`s behavioural intention in OL (Masry-Herzallah, 2022). Students' involvement in an OC is the main contributor to their attitudes and satisfaction concerning the OL and increases their motivation due to their collaboration with other learners (Torun et al., 2020).

Secondly, from an ecological perspective (mesosystem), the findings indicated that three characteristics of the course increase students' sense of satisfaction in OL: students' perceptions of learning effectiveness, quality of communication with the lecturer, and course assignments. These findings are consistent with previous studies that found a correlation between the effectiveness of the learning process, the quality of the relationship with the lecturer, and students' satisfaction and success in OL (Masry-Herzallah, 2022b; Utama, 2018). Other studies have indicated that a combination of

diverse teaching methods and student support has a positive effect on students' attitudes and success in OL (Barberà et al., 2016). These findings expand the findings of previous research which indicated that the effective structure and design of an OC using varied and flexible teaching methods with interaction between the lecturer and the learner, and support of the learner, all influence the students` satisfactions towards the course and their success in OL (Eichelberger & Ngo 2018; Nortvig et al. 2018). It is possible that watching the lecturer creates a sort of acquaintance with them. Using videoclips the students see the lecturer and hear their voice, something that reduces the distance between them, and may improve students' attitudes towards the clarity of the course. Additionally, it is possible that providing assignments throughout the course, once a fortnight also helped the interaction with the lecturer and maintained a constant interaction with the course lecturer.

Third, from the ecological perspective, the findings revealed that the macro- level influenced the micro-level. The findings clarify the influence of the variable sector (Arab / Jewish) on students' satisfaction and success in OL. The findings indicate that the use of varied learning tools correlated with high achievement of AS in the OC. However, the diversity of learning means was not found to correlate with JS achievements. Previous studies have indicated several gaps in academic achievement between majority and minority culture groups (Masry-Herzallah, 2022b; Zisberg, 2018). However, these studies did not examine the framework of an OC, nor graduate students in education.

It is concluded from the qualitative findings that a possible explanation for the gap between the AS' and JS' success in OL is related to the socio- cultural differences between these two groups. Previous studies have indicated a correlation between successful OL and cultural, social, and socioeconomic factors (Masry-Herzallah, 2022a; Williamson et al., 2020). There may be several explanations for the greater difficulty expressed by AS compared to JS. One explanation may be due to the requirement to write assignments in Hebrew, which is not the AS' mother tongue and makes it difficult for them to write assignments.

A second explanation relates to the economic and technological gap between Jewish and Arab societies. The course investigated in this study necessitated mastery of a variety of technology means such as presentations, video clips etc. Those technological means may be difficult for AS to exploit due to the digital gap between Arab and Jewish societies, which results from less integration of computer technology in the Arab education system (Masry-Herzallah, 2021). In the Arab education system, most students are not exposed to technological means, thus, they often lack the necessary self-esteem for success in academia. Insofar as their self-esteem is lower and their fear of failure is greater, they may have lower expectations to succeed in an OC (Masry-Herzallah & Stavissky, 2021a).

A third explanation may stem from the Western pedagogy that characterized the OC, including the use of individual learning processes, independent learning and critical thinking (Shamir-Inbal & Blau, 2021). However, the Arab society is characterized by a collectivist culture that does not support individual learning processes and critical

thinking, but rather a structured teaching process. In collectivist culture, teachers are traditionally at the center of the learning process, so their presence and authority are very important for AS (Masry-Herzallah, 2022a).

Additionally, asynchronous learning relies on independent learning skills (Onyema et al., 2020). The qualitative findings revealed that most of the AS expressed a lack of satisfaction with processes based on self-learning. Thus, teaching that is characterized by individualistic values may pose a threat to the perception of learning among AS, who are accustomed to studying within clear and focused rules and prefer traditional assessment. The findings of the present study regarding AS are in line with recent studies among students in the Arab world who are accustomed to learning that includes a strong dominant presence of the lecturer and a clearly structured teaching process (Walabe, 2020). Likewise, these findings can be explained from the qualitative findings related to the learning characteristics in the OC, which followed the principles of constructivist learning (Reid-Martinez & Grooms, 2018). The students were asked to perform five practical assignments of their choice. This style of learning without the lecturer and without a predetermined topic, may be difficult for the AS who are used to structured learning characterized by receiving clear answers from an authoritative teacher (Masry-Herzallah & Cohen, 2023; Wallabe, 2020).

THEORETICAL AND PRACTICAL CONTRIBUTIONS

The findings illustrate how students' satisfaction and success in an OC can be influenced by considering their personal and environmental characteristics. The main contribution of this research lies in its originality, i.e., the fact of discussing its results in the light of previous literature. In addition, the results obtained provide some implications for the development of theory, practice, and methodology. The study provides a theoretical contribution that will help researchers to better understand students` attitudes, satisfactions, and success in an asynchronous OC. The findings also expand existing knowledge concerning the social and cultural challenges involved in OL that characterize diverse student groups, especially members of minority societies within multicultural states. OC looking to improve the effectiveness of OL, it is recommended that administrators and instructors examine the full ecology of their students. Interventions addressing both internal and external factors that influence OL may provide more effective solutions than those that consider the environment alone.

Furthermore, the findings can inform higher education institutions to formulate plans for future OL as a part of their educational process. And this study highlights the role of OL in improving the university educational process and demonstrates that it is essential to consider the impact of self-efficacy and motivation on online students in attaining satisfaction and successful outcomes. Therefore, educators should be able to provide activities, content, and tools to motivate students when learning online, and also to facilitate their adaptation to the online system to sustain motivation during OL (Torun et al., 2020).

Finally, implications for methodology, our qualitative findings provide descriptions of the students` experiences of OL and enabled triangulation with the quantitative findings.

Mixed-methods methodology facilitated the exposure of contextual information on the participants' experiences. A social constructivist viewpoint emerged from the research analysis of the narratives of JS and AS about their OL experiences. The aim was that the research results would reflect the present situation of the AS and JS and lecturers in OL, so that the results could inform the optimal preparation of higher education's decision-makers to develop their teaching staff for effective OL.

LIMITATIONS

Although this study is novel in several ways, it has certain limitations. First, the study was restricted to a small group of student participants in a specific OC at a single college, and as such, findings should be considered in the context of this study. Additional data collection across different courses and institutions could seek to crystallize these findings further. Second, the sample was composed of students who were mainly practicing educationalists and committed to use academic literacy in their work. It is recommended that follow-up research should be conducted with a sample of students studying for a bachelor's degree in education. These students would be younger and not serving as educationalists in the field. Additionally, it is recommended that further research should relate to the same OC taught by a Jewish lecturer.

Finally, this study examined factors that predicted students' satisfaction and success in an asynchronous OC in general and whether the prediction was a difference in JS and AS, but did not examine the assimilation of the studied materials in practice. This means, there was no direct investigation of the students' internalization of the knowledge. So future research should examine whether the online method of teaching is indeed preferable to other teaching methods, traditional or non-traditional, in terms of actual acquisition of knowledge.

CONCLUSION

The full ecological model highlights the significance of factors such as students` TSE and motivation, course assignments and quality of communication with lectures, and other external forces, which emerged as influential elements affecting students` satisfaction and success in the OC. The students' voices presented here show that there are various avenues within a student's ecology which promote satisfaction and success in OL. Environmental approaches from previous research that mainly focused on the course microsystems have been further substantiated in this study, while factors from the meso, and macrosystems that encompass the greater student ecology have emerged as additional avenues for enhancing satisfaction and success in OL. This study highlights the great importance of adapting online teaching to the cultural diversity of students and especially for students who come from collectivist culture. For the success of these students, teachers must diversify their learning means, proactively make their support accessible and gradually advance the demands of independent learning.

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