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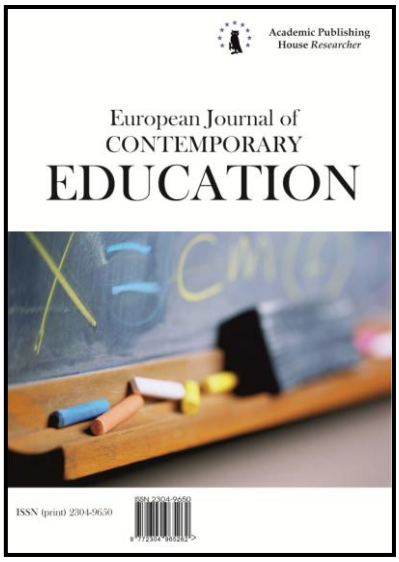

The Perception on Fundamentals of Online Courses: A Case on Prospective Instructional Designers

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Abstract

This study focuses on prospective instructional designers' perception toward creating online courses including which elements are essential for developing such platforms. The study is significant for revealing what the prospective instructional designers focus on while they design certain learning opportunities. The participants of the study were the "Computer Education and Instructional Technology (CEIT)" students from a university in Turkey (n=133) ranging from freshman to senior grades. Since the study aimed to obtain data to determine specific characteristics of a group, a non-experimental survey research design was employed. The participants were asked to assess the importance of fifteen online course elements (such as texts and videos). Afterwards, the participants were provided with seventeen sentences to reveal their thorough perceptions toward designing online courses. The study identified that the participants value feedback mechanism (M=4.69) at the most. The participants believed that the type of web browsers (M=4.50), the course login system (M=4.48), emailing tools (M=4.42), texts (M=4.32) and pictures (M=4.22) are fundamental elements of any online course. The study revealed that prospective instructional designers for online platforms were furnished themselves with the essence of offering online instructional activities. In this study as an example of gender related study, the significant differences on study items were found between males and females participants in terms of their perceptions on online courses. The results showed that voice mechanism was more important for female participants than male and female participants were logically-oriented and visual learners' during the entire online session.

Keywords: Distance education, Online course, Instructional design, Online tools, Student perception.

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Introduction

In parallel to the latest developments in Information and Communication Technologies, online platforms are getting indispensably vital for many sectors, including business, education, and health. Therefore the design and development issues regarding to online learning platforms are becoming an important concern for many stakeholders in these sectors. Whenever and wherever access to the online platforms offers an opportunity for lifelong learning including formal and non-formal settings.

Utilization of online instruction has been increasing in the universities from all over the world (Kiviniemi, 2014; Porter, Graham, Spring & Welch, 2014). Within this framework, there are many different tools to offer instruction, such as Massive Online Open Courses (MOOCs), mobile applications, multimedia software (including a wide range of tools, such as tutorials), or learning management systems such as Moodle, Sakai or Blackboard (McCutcheon, Lohan, Traynor, & Martin, 2015).

Many scholars noted that online courses have been getting explosively popular over the last few years. Online courses are widespread in many countries due to their advantages such as; allowing users the flexibility of operating outside of the constraints of time and place, minimizing the educational costs, destroying the time barrier for learners, creating personal learning environments and the possibility of providing a world class education to anyone with a broadband connection (Gilbert, 2015; Bolliger & Halupa, 2012; Revere & Kovach, 2011; Oliver, Kellogg, Townsend, & Brady, 2010; Tsai, 2010; Wang, & Chen, 2011; Nguyen, 2015). Moreover, changes in the nature of students, innovations in information and communication technologies, and the deficiency in the number of offline higher education institutions have increased the registration rate to online courses (Akdemir, 2011).

Lawton, et al. (2012) remarked that online education is not only important for formal school settings but also indispensable for workplaces where the workers must be lifelong learners and increase their current skills and abilities. Therefore, designing online courses is extremely important for business industry as well (Revere & Kovach, 2011).

The more attention to online courses increases rapidly, the more developers of such systems concentrate on their online platforms. Many researchers, designers or developers are offering suggestions for increasing the quality of the online courses. For instance, Alblehai (2011) provides a long list of recommendations on creating an effective online learning environment. He states that online courses should offer external links to other learning resources, animation presentations and other visual aids including self-assessment or course-assessment tools for measuring the level of learning and put a balance between learning and the tools used for learning. In the Academic Partnerships Report (2014), the answer question "How can instructional design, learning materials, and course presentation contribute to quality online learning?" was expressed in a very good way. According to the report, the following four key design principles were summarized: i) consistent layout and design; ii) clear organization and presentation of information; iii) consistent and easy-to-use navigation; and iv) aesthetically pleasing design and graphics.

There are many institutions offering online courses for different age groups in different subject matters. On the other hand, there is an ongoing dispute on the effectiveness of these online courses (Tsai, 2010). Fabry (2009) gathers the problems about designing online education under two major branches: insufficient pedagogical and technological knowledge regarding with the online education tools and insufficient knowledge about student centered learning regarding increasing the learning outcomes. Fabry notes that using multiple online tools does not guarantee effective learning outcomes.

Similar to Fabry' work (2009), Abdous and He (2008) criticized the management of online course design and development processes, and summarized the adverse effects of insufficient management as poor online course quality and delays in course offerings.

Fabry (2009) pointed out the importance of conducting research on online education "in order to create instructionally sound courses, research-based principles need to be applied" (p.255). For example, Lawton, et al. (2012) conducted a study on realizing how different online course designs affect the learning outcomes. They concluded that providing feedback mechanism is the most essential and common feature of all kinds of online courses. Moreover, their study showed that different designs directly affect the learning outcomes of any online courses.

Alblehai (2011) conducted several interviews with ten teachers on revealing their perceptions toward designing online education and underlying the factors affecting its success. Alblehai concludes that teachers wanted to be a part of designing and developing processes for online courses. Alblehai strongly emphasizes that in the transition from traditional education to online education, the ideas and attitudes of teachers about e-learning play an essential role. Therefore, it is vital to understand the current positions of teachers before moving toward hybrid or online education in any institution.

Although there is a sufficient amount of literature on developing online courses, there are few studies on what prospective instructional designers consider about online course design (Power, 2008). While designing online courses, it is important for teachers to realize online learners' characteristics and the tools for addressing their needs (Oliver, Kellogg, Townsend, & Brady, 2010). Wang and Chen (2011) recommend more studies on instructors' three-dimensional proposition for improving the following aspects online courses' quality: pedagogy, technical knowledge and design skills. Revere and Kovach (2011) highlight that teachers and students should be integrated into design processes.

Both the features of online learners and their effects on predefined learning outcomes are the major concerns for researchers. In that sense, many researchers have conducted studies with different methods (such as qualitative or quantitative) in order to delineate online learners' features affecting positive results on online instructional settings. Comprehensively, these research studies concentrate on different subject matter areas, including schooling levels, class sizes, course durations, demographics (age, gender and the online courses registered), and sample sizes. Results yielded that these listed features have the effect on online learning success criterion. For instance, different studies revealed that there is a significant gender difference in online learning perception reflecting on learning outcomes (Tsai & Tsai, 2010; Johnson, 2011; González-Gómez, Guardiola, Rodríguez, & Alonso, 2012; Ashong & Commander, 2012).

This study focuses on understanding the effect of gender and online course experiences (including the schooling year) regarding their perceptions of online courses. In addition, this study aims to delineate the perceptions of prospective instructional designers on developing online courses. Therefore, the following research questions have been developed for this study:

1. What are the demographics and online course experiences of the participants?
2. Which tools are valued more by the participants for designing online courses?
3. What are the perceptions of the participants in designing online courses?
4. Is there any significant difference between gender (male/female) regarding the online course tools and the perceptions?
5. Is there any significant difference among years of the study (freshman, sophomore, junior and senior) regarding the online course tools and the perceptions?

Methodology

This part consists of information regarding the study methodology; the participants and sampling, the study instruments, the research design, and how the data are analyzed.

1. Participants

The study participants were the "Computer Education and Instructional Technology (CEIT)" students from a private university in Turkey (n=133). The Department of Computer Education and Instructional Technology, which is a four-year undergraduate program, is a multidisciplinary department that brings together the field of education with computer technologies and instructional technologies. In the CEIT program, through courses such as programming (C++, Java), multimedia development (Flash, Actionscript), graphic design (Photoshop, Fireworks, Freehand, Illustrator, InDesign), 3d design and modeling (3ds Max) and Internet-based application development (Dreamweaver, HTML, Javascript, CSS, AJAX, PHP), students gain technical knowledge and skills to develop computer-based applications, and they consolidate this knowledge by developing pedagogical applications in instructional technologies courses. As a prospective instructional designer, students, who gain knowledge about operating systems, network topology and management, database, and computer hardware during their education, can work as programmers, web designers or system experts upon graduation. During their four years of education, students develop applications such as pedagogical animations, pedagogical software,

pedagogical websites and a course management system after they acquire theoretical knowledge and practical experience in the following areas: pedagogical design, computer-based educational environment development, online course development and visual design. The students, who have the ability to evaluate the applications on the market from pedagogical and design perspectives, can work as educational specialists, educational technicians or instructional designers for individuals of all ages in different types of educational institutions and companies. In this study, the participants whose ages range from 19 to 30 years with an average of 23 were purposefully selected for the study due to the following reasons: (i) the participants had knowledge about designing, developing and implementation of the tools utilized on offering online courses, (ii) the participants were becoming familiar with the design of both offline and online instructional settings, and (iii) the participants would be assigned jobs on offering and managing online courses. Table 1 presents the participant' information regarding their grades (the year of the study), gender (female or male) and online course experiences.

As shown in Table 1, although participant students in the first grade level (N=20) have no experience in online course development, they have experienced two online courses and they have perceptions on this subject. The second grade students (N=34) have experienced one course in online course development and they have experienced three online courses in total. Furthermore, it is observed that in the following grade levels, the students have adequate experience in online courses.

Table 1. The Demographics and Credit Information by Quoted (#) Participant

Grade	Gender		Total	Online Course Experience		Total # of Online credits (Taken and Developing)
	Male	Female		Taken Online Course/# of credits	Developing Online Course/# of credits	
1	9	11	20	2 course/6	-	6
2	17	17	34	3 course/9	1 course/4	13
3	15	21	36	7 course/23	3 course/12	35
4	18	25	43	9 course/29	5 course/18	47
Total	59	74	133	9 course/29	5 course/18	47

2. Instrumentation and Design of the Study

Since the study aimed to obtain data to determine specific characteristics of a group, a non-experimental survey research design was employed. First, the participants were asked to assess the importance of fifteen online course elements (such as texts, videos, discussions, whiteboard) on a five level Likert-type scale (from "not important" to "very important"). Afterwards, the participants were provided with seventeen sentences for revealing their thorough perceptions toward designing online courses on a five level Likert scale from "totally agree" to "totally disagree". The questionnaire was administered to the CEIT and data were obtained from different classes on a voluntary basis.

Findings/Results

The participants' ranking on the importance of the distance learning tools for a course was tabulated in Table 2 (n=133). The Cronbach's alpha reliability coefficient was calculated as 0.69 with the 15 items and 133 participants showing that the instrument was reliable enough for a survey.

The study identified that the participants value feedback mechanism (M=4.69) the most. Subsequent to feedback offer, the participants believed that the type of web browsers (M=4.50), the course login system (M=4.48), emailing tools (M=4.42), texts (M=4.32) and pictures (M=4.22) are fundamental elements of online courses.

Table 2. Online course elements and participants' mean scores

Online Course Elements	Min.	Max.	M.	S.D.
Feedback mechanism	3.00	5.00	4.69	0.56
Web Browser	2.00	5.00	4.50	0.65
Login system	2.00	5.00	4.48	0.69
Emailing	3.00	5.00	4.42	0.63
Texts	2.00	5.00	4.32	0.68
Pictures	2.00	5.00	4.22	0.66
Video Conferencing	2.00	5.00	4.03	0.82
Videos	2.00	5.00	4.00	0.77
Exam	1.00	5.00	3.97	0.90
Forum	1.00	5.00	3.96	0.96
Voice Conferencing	1.00	5.00	3.93	0.84
Voices	2.00	5.00	3.91	0.80
Customizable Interface	1.00	5.00	3.73	0.98
Whiteboard	1.00	5.00	3.70	0.91
Chat	1.00	5.00	3.67	0.97

Table 3. Items and mean scores on designing online course elements

No	Item	Min.	Max.	M.	S.D.
14	The pages should be loaded easily.	2.00	5.00	4.69	0.55
10	The students should easily communicate with the instructor online.	3.00	5.00	4.64	0.57
6	The course should be fully functional.	3.00	5.00	4.64	0.59
13	The course should use language well.	2.00	5.00	4.63	0.56
2	Help option should be presented during the entire online session.	3.00	5.00	4.63	0.52
7	The course materials should be parallel to the nature of the course.	3.00	5.00	4.59	0.53
3	A course syllabus should be presented no later than the first class.	2.00	5.00	4.57	0.63
4	Online materials should be attractive.	3.00	5.00	4.57	0.58
9	Online materials should be presented logically.	2.00	5.00	4.54	0.60
12	The online course should be interesting.	3.00	5.00	4.48	0.65
16	Design and realization of offering exams online must be taken into particular consideration.	2.00	5.00	4.41	0.60
8	The online materials should be presented in such a way that it is well-matched with different learning styles.	2.00	5.00	4.36	0.69
15	Whenever it is appropriate, external professionals should be invited to the online course.	2.00	5.00	4.31	0.67
11	The course learners should be able to access to the entire classroom via organized forum discussions.	2.00	5.00	4.27	0.64
5	The online course should offer external websites for its learners.	2.00	5.00	4.24	0.68
17	The course should provide statistics about the learners' login times and the total time they spent on the system.	1.00	5.00	4.02	0.88
1	A course introduction should always be online.	1.00	5.00	3.82	0.92

Additionally, the participants' mean scores on their thorough perceptions toward designing online courses on a five level Likert scale from "totally agree" to "totally disagree" were tabulated in

Table 3 (n=133). The items were listed from the highest to lowest mean scores. The Cronbach's alpha (reliability coefficient) was calculated as 0.83 with the 17 items and 133 participants which shows the instrument was reliable.

From the Table 3, the participants reported that the online course pages should be loaded easily (M=4.69) so that the whenever and wherever access feature should always be available for the users. Similar to feedback issue, the participants reported that online students should easily communicate with the instructor online (M=4.64). Additionally, the entire course should be fully functional (M=4.64) and should use language well (M=4.63). The participants also reported that the "Help" option should be presented during the entire online session (M=4.63) where there is geographical distance in the nature of online platforms. The lowest mean score focused on the existence of an instructor in an online course (M=3.82).

Subsequent to previous statistics, an independent sample t-test was conducted in the data set to determine whether or not gender makes a difference on the study items. Table 4 demonstrates that eleven items significantly differ on gender variable. It reveals that mean scores of female participants are significantly higher than male participants'.

Table 4. The independent sample t-test on items

Item No: Item description	Gender	n	M	S.D.	t	p
Voice (as an online course elements)	Female	74	4.08	0.75	2.680	0.008
	Male	59	3.71	0.83		
2: Help option should be presented during the entire online session.	Female	74	4.74	0.46	2.607	0.010
	Male	59	4.50	0.56		
4: Online materials should be attractive.	Female	74	4.66	0.53	2.041	0.043
	Male	59	4.45	0.62		
9: Online materials should be presented logically.	Female	74	4.67	0.52	2.927	0.004
	Male	59	4.37	0.66		
10: The students should easily communicate with the instructor online.	Female	74	4.74	0.49	2.183	0.031
	Male	59	4.52	0.65		
13: The course should use language well.	Female	74	4.78	0.41	3.417	0.001
	Male	59	4.45	0.67		
14: The pages should be loaded easily.	Female	74	4.79	0.40	2.515	0.013
	Male	59	4.55	0.67		
16: To design and realization of offering exams online must be taken into particular consideration.	Female	74	4.52	0.52	2.471	0.015
	Male	59	4.27	0.66		

Furthermore, the data set was checked for significant differences in accordance with grade variable by the one-way ANOVA test. As Table 5 shows, four course elements (chat, exam, feedback mechanism and login system) and four survey items (3, 6, 8, and 17) differed in grade variable. Follow-up tests were performed on the main effect of four levels of students' grades (1:freshman, 2:sophomore, 3:junior and 4:senior) on the survey items to find out which level(s) differ(s) significantly among the group. Results of the Levene's test of equality of error variances were significant; from these results it could be concluded that group variances of the dependent variable were not homogeneous. Hence, by assuming unequal variances among groups (according to the Creswell, 2013), Dunnett's C test was used for follow-up testing as illustrated in Table 5.

Table 5. The one way ANOVA test on differences among groups in different levels of study

Item	Grade	1	2	3	4	n	M	S.D	F	p
Chat	1	---				20	3.40	1.14	4.395	0.006
	2	NS	---			34	3.29	1.03		
	3	NS	NS	---		36	3.80	0.74		
	4	NS	*	NS	---	43	4.00	0.89		

Item	Grade	1	2	3	4	n	M	S.D	F	p
Exam	1	NS				20	3.15	1.13	8.647	0.000
	2	*	---			34	4.11	0.72		
	3	*	NS	---		36	4.30	0.70		
	4	*	NS	NS	---	43	3.97	0.85		
Feedback Mechanism	1	---				20	4.15	0.74	8.625	0.000
	2	*	---			34	4.73	0.56		
	3	*	NS	---		36	4.83	0.37		
	4	*	NS	NS	---	43	4.79	0.46		
Login System	1	---				20	4.05	0.60	8.556	0.000
	2	*	---			34	4.23	0.78		
	3	*	NS	---		36	4.61	0.68		
	4	*	NS	NS	---	43	4.79	0.46		
3	1	---				20	4.10	0.91	5.224	0.002
	2	*	---			34	4.67	0.47		
	3	*	NS	---		36	4.72	0.51		
	4	*	NS	NS	---	43	4.60	0.58		
6	1	---				20	4.30	0.73	3.116	0.029
	2	NS	---			34	4.64	0.64		
	3	*	NS	---		36	4.77	0.48		
	4	NS	NS	NS	---	43	4.69	0.51		
8	1	---				20	4.30	0.65	5.265	0.002
	2	NS	---			34	4.02	0.79		
	3	NS	*	---		36	4.63	0.54		
	4	NS	NS	NS	---	43	4.44	0.62		
17	1	---				20	3.55	1.19	4.809	0.003
	2	NS	---			34	3.79	0.84		
	3	NS	NS	---		36	4.16	0.77		
	4	NS	*	NS	---	43	4.30	0.70		

Note. Dashes indicate that cell value is zero. NS = non-significant differences between pairs of means, while an asterisks (*) =significance using the Dunnett's C procedure.

As a general finding from Table 5, it discloses that as the students promote to upper grades in their studies: sensitivity and knowledge regarding the importance of certain elements for online courses were significantly stimulated.

Discussion and conclusion

The study participants were both the students who were learning online course design, development and evaluation processes and prospective online course designers who will implement what they have learnt in their participated classes. As a result, the participants appreciated the importance of feedback mechanism which is one of the essential elements within the learning and teaching cycle. As students, they wanted to learn about their personal progress in the form of feedback which reflected their personal learning history in the form of further "what-to-do" point. Bolliger and Halupa (2012) also found that the providing tools for timely feedback is essential for learners as well as designing online courses which motivate and encourage the learners within the course.

Moreover, the participants also value the importance of basic literacy elements, texts and pictures. Oliver, Kellogg, Townsend, and Brady (2010) emphasize that the use of texts and pictures is essential for non-traditional online courses, especially for younger students. Therefore, it is good to reveal that prospective instructional designers pay attention to the basics of instructional message design.

The participants also appreciated the existence and the functionality of forum based discussions within the online courses. As Revere and Kovach (2011) pointed out forum discussions

are important for online students to keep their engagement with learning process and peer interactions. The participants gave the least mean score to the chat tool which is synchronous two-way communication tool. Although Revere and Kovach (2011) stated that the chat tool is much more preferable than discussion tools (as they prevent the delays in messaging), these study participants preferred the forum discussions more than instant messaging tool; chat. The participants of this study might think that responding with more elaboration is much better and safer than responding immediately.

Additionally, it appears that the participants were also knowledgeable about technological side of the online course as they rated web browsers and login systems as the most important elements of online courses. These two elements are highly important to provide the "whenever and wherever access" feature of online courses. Moreover, the login systems are important for many aspects of offering online courses, such as keeping students' progress, providing confidentiality of shared data on the system.

The participants also pay attention to the functionality of the online courses. For instance, according to the participants, the online course pages should be loaded easily so it provides the maintenance of whenever and wherever access feature of online courses. Similarly, in order to support functionality of the system, the participants pointed that the "help" option should be visible all the time.

In addition to functionality, the participants consider the significance of the two-way communication where they stated that online students should easily communicate with the instructor online via different course elements. Similar to the results of Bolliger's and Halupa's study (2012), the participants paid specific consideration to the interactions with their classmates and course instructors. The two-way communication is extremely vital for learners who are geographically distant to each other. Therefore, the designers must offer interaction tools as much as they can for the learners.

On the other hand, the lowest mean score focused on the existence of an instructor in an online course. This contradictory finding shows that the participants were aware that it is impossible to make an instructor available online all the time. As Akdemir (2011) specified, the participants realized that teaching online is very challenging. That problem could be overcome by the existence of asynchronous online elements within the course context.

The study showed that the prospective instructional designers for online platforms were furnished themselves with the essence of offering online instructional activities. In other words, the online course designers are able to develop well-designed courses for their learners. This is a vital situation which offers better opportunities for the online instruction in general. As Oliver, Kellogg, Townsend, and Brady (2010) emphasized, online course designers, as the case in this study, must be knowledgeable about both the technological aspects (such as the tools, their functionalities and drawbacks) and the pedagogical aspects (such as advantages of different tools for learning and the online learners' characteristics) of online instruction.

There are also conflicting findings among the items. For instance; the participants strongly agree that the students should easily communicate with the instructor online, whereas the chat tool or video conferencing had lower mean scores than other course elements. Similarly, customizable interface which is an important element for addressing different users' needs and expectations has lower mean scores; yet, the participants declared that the online materials should be presented in such a way that they are well-matched with different learning styles. These conflicting results might appear because of lack of real online experiences in which the participants will realize the importance of these elements for an effective online course.

In this study, as an example of gender related in study, the significant differences on study items were found between males and females participants in their perceptions on online courses. As an online course element, we found significant differences in only voice mechanism (Table 4). This result indicated that voice mechanism was more important for female participants than male. Similarly, Ching & Hsu (2015) found that females preferred audio discussion more than males did, and more females reported that audio discussion strengthened their connection with peers. In addition, as we predicted, female students seem to experience more voice in online environments, and this contributes in turn to greater perceived learning for females as compared to male students. In addition, some significant differences between designing online course elements items and the gender variable were found in this research. Specifically, female participants in this

study reported a more positive view than male participants in these facets: help option during online session; attractive, logically located and easily loaded materials with well language; easily communicate with instructor; students have opportunities to solve course related exam by online. These results were in line with previous research showing that females are more communication-oriented in an online environment, seeking interaction with others (Tsai & Tsai, 2010). From social a cognitive psychology perspective, gender differences seem to be important in help-seeking and supportive behaviours (Wester, Christianson, Vogel, & Wei, 2007; Jeff, 2011). An empirical study found that females are more willing to seek help for their problems in online environments than male (Lehdonvirta, Nagashima, Lehdonvirta & Baba, 2012). Koohang, Paliszkiewicz, and Nord (2015) asserted that a vital element in the success of online learning environments is instructional design with the incorporation of usability properties such as simplicity, recognition, comfort, user friendliness, control, navigability, load time, visual appearance, consistency, well-organized materials, understandability, and relevancy to the online learning courseware. In our study, some of these usability properties such as attractiveness (related to the visual appearance), logically located and easily loaded materials with well language (related to the control, navigability, load time well-organized) examined that female participants' scores differed from male participants' in a positive way during the entire online session. These results demonstrate that female participants have logically-oriented and visual learners' characteristics. On the other hand, female participants showed a tendency toward visual and sequential styles during the entire online session.

As a recommendation, the instructors should offer real case studies or experiences to their learners so that the learners could realize the implementation of theoretical knowledge gained through the instructional activities.

Some limitations of this study must be noted here. First, the study was conducted at one university. Moreover, since this study only focused on the quantitative data through self-reporting data gathering, it requires to be replicated for collecting more in-depth knowledge with qualitative methods. Moreover, enhancing the sample to other contexts will assist to comprehend the current study phenomenon.

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