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Development of a Perceptions of Online Learning Scale

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Full Title:	Development of a Perceptions of Online Learning Scale
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Author Note

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Abstract

The sudden switch to online learning brought an unintended spotlight to the gradually expanding educational innovation of online instruction. Online learning has generally been stigmatized as less effective than traditional face-to-face learning. The learning of students tends to be influenced by teachers' individual differences and perceptions of online learning. In this study, we describe the development of a new perceptions of online learning scale (POOLS). The POOLS seeks to measure perceptions of online learning across four theoretical constructs associated with quality education in both online and traditional face-to-face formats. Existing measures to assess perceptions of or readiness for online learning are learner-focused and could not reflect the psychological foundation of the teacher population. The POOLS was constructed using expert review and a sample of 654 adults responded to the survey. We conducted an exploratory factor analysis and confirmatory factor analysis on split halves of these data. The results of this initial validation study provide the basis for using the POOLS as an approach to measuring four aspects of perceptions of online learning: Effective Learning ($\omega^2 = 0.77$), Student-Centered Learning ($\omega^2 = 0.67$), Interactive Learning ($\omega^2 = 0.73$), and Engaged Learning ($\omega^2 = 0.66$). We recommend that the POOLS be used at an aggregate level to describe the general relationship between these factors and other characteristics such as self-efficacy, amount or type of experience with online learning, and personality traits.

Keywords: online learning, reliability, assembled validity, test development

Practical Significance Statement

In this study, we developed an approach to measuring four aspects of an individual's perception of online learning. The results provide evidence that this new questionnaire can be used to help assess perceptions of online learning as more schools transition to an online instructional format.

Development of a Perceptions of Online Learning Scale

In the wake of the COVID-19 pandemic, an estimated 1.2 billion school-aged children around the world were displaced from their classrooms, leading to a drastic rise in various forms of online learning (Li & Lalani, 2020). The sudden shift in educational routine widely impacted the United States educational system where an estimated 55 million school-aged children were displaced from their classrooms (García & Weiss, 2020). The U.S. Census Bureau's Household Pulse Survey indicated that 93% of U.S. households with school-age children reported some form of distance learning in the wake of the COVID-19 pandemic (Mcelrath, 2020). The same study reported that 80% of those U.S. households' students were using online learning resources while about 20% were using paper materials sent home from the school.

The sudden switch to online learning brought an unintended spotlight to the gradually expanding educational innovation. A recent Pew Research Center survey (*n*=2,561; Horowitz & Igielnik, 2020) found that parents whose students are receiving online-only instruction or a mix of face-to-face and online during the pandemic are less satisfied with the way their schools are handling teaching and learning during the COVID-19 pandemic. In general, parents and teachers are concerned about their students falling behind due to shifts in teaching and learning during the pandemic. Income demographics differences further complicated these perceptions of learning quality. Almost three-fourths of parents with lower income (72%) say they are very or somewhat concerned with their children falling behind compared to 63% of middle income and only 55% of high-income parents (Horowitz & Igielnik, 2020). Among upper-income students, 40% are receiving online-only instruction while lower-income students receive online-only instruction at higher rates (53%).

Online learning has generally been stigmatized as less effective than traditional face-to-

face learning (Hodges et al., 2020) even though research to support that assertion is inconclusive. Whether or not online learning is more or less effective than traditional learning models is not easily answered. The relative effectiveness between modalities may depend largely on how one defines online learning. Definitions of online learning can range from well-planned learning designs intended for virtual learning spaces to sudden switches to emergency remote teaching (Czerniewicz, 2020; Hodges et al., 2020). Intuitively and empirically, the former is more effective than the latter (see Means et al., 2014). Highlighting the complexity of perceptions of online learning, Czerniewicz (2020) described how university shutdowns due to political unrest in South Africa forced teaching and learning to switch online. She noted that the very perception of online learning was heavily tainted by the politics of the situation rather than a true reflective assessment of online learning. It is possible Czerniewicz's cautionary tale applies to the COVID-19 sudden shift to online learning—perceptions of online learning may be laden with political clutter.

Perceptions of online learning existed before the COVID-19 sudden shift in educational delivery, and those perceptions are continually being impacted by the displacement of students and techniques of emergency remote learning. The purpose for developing the Perceptions of Online Learning Scale (POOLS) was to move beyond simple satisfaction surveys and develop a theoretically grounded and psychometrically sound tool to measure perceptions of online learning among teacher populations. Existing measures to assess perceptions of or readiness for online learning are learner-focused (Hung, et al., 2010; Muilenburg & Berge, 2005; Young, 2016), and could not reflect the psychological foundation of the teacher population. Teachers' individual differences and perceptions tend to influence the way they teach and interact with students (Brophy & Good, 1974; Hardré & Sullivan, 2008; Skinner & Belmont, 1993). The

research goal for developing the POOLS is to explore ways that teachers' perceptions of online learning influence the way they teach and interact with students. For instance, Hardré and Sullivan (2008) noted that teachers' perceptions of external and systematic factors influence and constrain the options they believe they have and the strategies they choose to use. At the time, Hardré and Sullivan were not specifically focusing on online learning, but the increased use of online learning is arguably a systematic factor about which teachers likely have clear perceptions.

Theoretical Framework

Quality online learning has been defined in a comprehensive set of standards specifying industry standards for online teaching, online programs, and online courses (Quality Matters & Virtual Learning and Leadership Alliance, 2021). Those sets of standards broadly establish what is expected of high-quality online learning. The *Perceptions of Online Learning Scale* (POOLS) was derived from those broad standards of quality online learning. The POOLS seeks to measure perceptions of online learning across four theoretical constructs associated with quality education in both online and traditional face-to-face formats.

Effective Learning

Learning is an activity that involves both mental processes and behavior or action (Ormrod, 2016; Watkins et al., 2002). Therefore, any measure of effective learning must consider both the acquisition of new knowledge and its use or application. Defining effective learning can be challenging because learning occurs in a wide variety of contexts and domains and is studied across differences in learning theory (Conole et al., 2004; Dunlosky et al., 2013; Mortimore, 1993; Ormrod, 2016). Effective learning measured in POOLS items includes cross-domain characteristics reflecting both the process and the outcomes of effective learning

(Atkinson et al., 2006; Conole et al., 2004; Dunlosky et al., 2013; Harden & Laidlaw, 2013; McTighe & O'Connor, 2005; Mortimore, 1993; Ormrod, 2016; Watkins et al., 2002). Effective learning is defined as learning in which students masterfully acquire and utilize relevant new knowledge and/or skills, as witnessed through application and assessment that occur within or outside the immediate classroom.

Student-Centered Learning

Student-centered approaches to learning may be traced back to Dewey's belief that teacher instruction should be driven by students' unique interests and characteristics (Schiro, 2012). Student-centered learning is characterized by high levels of student direction, student-based activities, interactions, and assessments. In student-centered learning environments, students work collaboratively to achieve learning goals based on their interests, with teachers' facilitation (Pedersen & Liu, 2003). Student-centered approaches include models such as case-based learning, problem-based learning, and team-based learning, and they can be applied in both online learning and face-to-face settings. Empirical evidence supports that the student-centered approach enhances student learning and motivation (Cornelius-White, 2007; Wilson et al., 2018). For the POOLS, student-centered learning is defined as learning that empowers students to actively drive and direct the learning process rather than be a passive receiver of teacher-centered instruction.

Interactive Learning

Interaction is a reciprocal event that requires two elements that are mutually influencing one another (Wagner, 1994). Moreover, interactive learning is conceived of in a three-part interactive scheme: (a) learner-instructor interaction, (b) learner-learner interaction, and (c) learner-content interaction (Moore, 1989; Su et al., 2005). For the POOLS, interactive learning

involves three facets of interaction: (a) student to instructor, (b) student to student, and (c) student to content. These interactions contribute to quality learning singularly as well as in combination. All three facets of interaction can be present regardless of the learning mode (online or face-to-face).

Engaged Learning

Engagement in the learning process generally refers to the extent to which a student is actively involved in learning activities (Reeve, 2012). Engagement may be observed in three related categories. Cognitive engagement involves thinking, integration of ideas, setting learning goals, self-regulation, and intentional efforts to understand. Affective engagement includes enthusiasm, curiosity, interest, and finding relevance and satisfaction in the process of learning. Behavioral engagement is observed as effort, attention, focus, personal agency, attempting and completing work (Bond & Bedenlier, 2019). Student engagement in acts of learning generally leads to positive short and long-term outcomes that can in turn support continuous engagement (Bond et al., 2020). For the POOLS, engaged learning was defined as the energy and effort that students present in their learning environment. Engagement can be influenced by internal factors as well as environmental factors, and higher levels of engagement generally support more efficient learning, retention, and transfer.

Current Study and Purpose of the POOLS

The purpose of this study is to report on the development and initial validation of the POOLS. The POOLS asks participants to compare online learning to face-to-face learning on items measuring effective learning, engaged learning, interactive learning, and student-centered learning. The research goal is to use the POOLS to examine ways that demographics, prior experiences, and personality traits influence perceptions of online learning. The purpose of the

POOLS is therefore to help evaluate the trends in the relationship among perceptions of online learning and demographics, prior experiences, and personality traits. As defined in this study, we do not intend for this instrument to be a sensitive measure for individual teacher-level inferences.

Methods

The construction of the POOLS was guided by standards for online teaching, online programs, and online courses (Quality Matters & Virtual Learning and Leadership Alliance, 2021). Using the definitions previously given, we generated a list of 57 items to use in the first review by content area experts. Content experts of online learning were contacted to anonymously review the construct definitions, item content, and scale structure. Experts were determined by their experience with online teaching and online program coordination. In the first round of item review, eight experts provided feedback, and this feedback is openly available online (REMOVED FOR PEER REVIEW). The scale was revised based on this feedback for use in an initial data collection.

Participants were recruited as volunteers through advertising on social media. A total of 654 adults responded to the survey. The only demographic data we collected were two indicators of experience with online learning. We asked (1) whether the participant had ever taken a class online (yes/no), and (2) whether the participant had ever taught a class online (yes/no). No other demographic or identifying information was recorded.

Using the responses gathered from social media, we randomly split the data in half for (1) use in exploratory factor analysis (EFA) and (2) use in confirmatory factor analysis (CFA). After the EFA, we sent the revised scale to subject matter experts for the second round of review. In the second round of item review, three experts provided feedback. All expert reviews are available online (REMOVED FOR PEER REVIEW). We used these comments for determining

the factor structure to test in the CFA. For the CFAs, we treated the observed data as continuous and used maximum likelihood with robust standard errors and the Satorra-Bentler scaled test statistic. Additional information about the statistical methods used for initial item analyses, EFA, and CFA can be obtained through our online supplemental material (REMOVED FOR PEER REVIEW). We limit those details here due to space restrictions.

Results and Discussion

The initial item review by content experts resulted in a modified survey with 57 items. Due to space restrictions, we limited this brief report by giving the statistical evidence gathered for evaluation of these 57 items; however, the interested reader is referred to our supplemental material for detailed documents on the changes and suggestions made by content experts. The results of the initial item analyses and EFA are reported in Table 1. For reporting the EFA, we used the results based on the (co)variance matrix of the imputed data (not reproduced here due to space). The scree plot of the eigenvalues and the corresponding parallel analysis suggested that between four and six factors may be sufficient to explain the covariances among these 57 variables. After examining the four, five, and six-factor EFA solutions, we identified the four-factor EFA solution as most explainable, reported here. The results of all EFA solutions tested are reported in our supplemental material.

The four-factor EFA solution provided the structure for reducing the item pool to a manageable size in line with our theoretical framework and the intended use of the instrument. Reducing the item bank is necessary because, as described in the section Current Study and Purpose of the POOLS, the intended purpose is to use the POOLS as part of a larger battery of instruments. Therefore, we aimed to make the POOLS as parsimonious as possible while maintaining the meaning of each subscale. Items were removed because (1) the item did not load

Table 1. Item descriptive information and EFA results

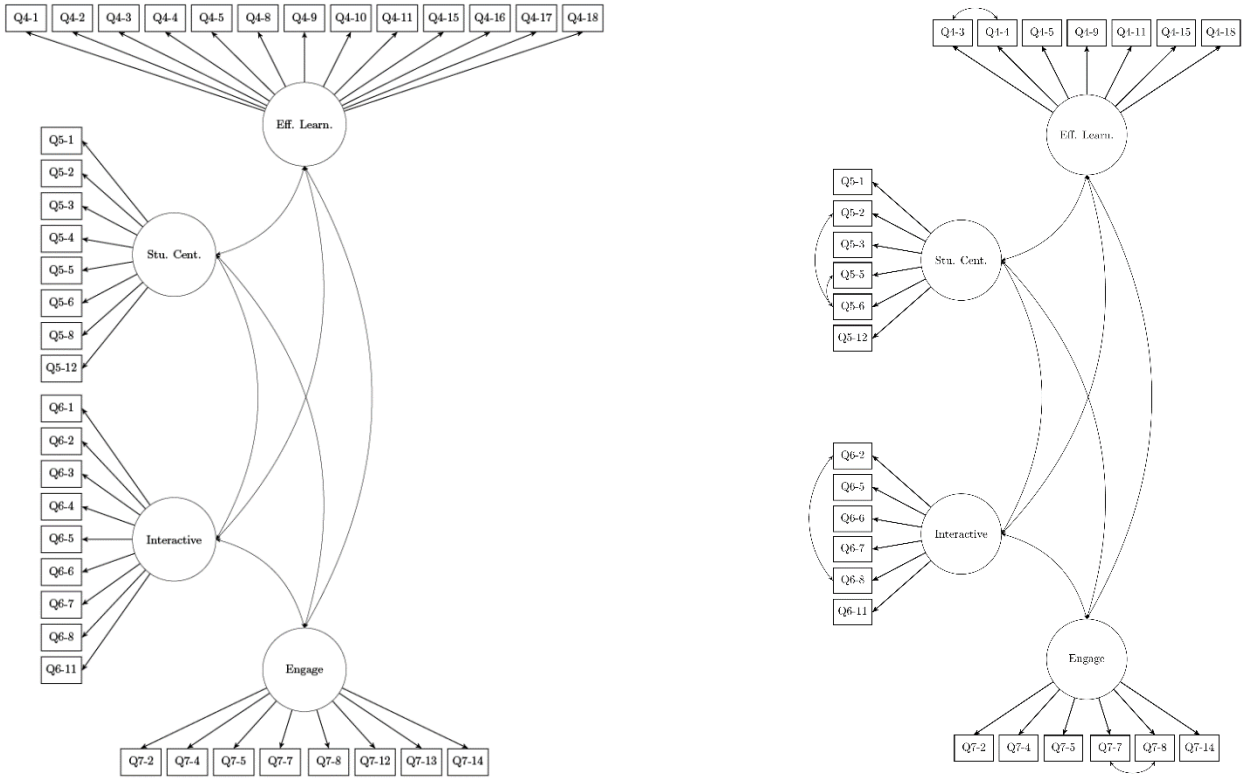
Item Summary				EFA Results				Item Summary				EFA Results			
Item	M	SD	ITCc	F1	F2	F3	F4	Item	M	SD	ITCc	F1	F2	F3	F4
Q4-1	2.46	0.87	0.72	0.92				**Q6-1**	1.70	0.84	0.66		0.90		
Q4-2	2.30	0.82	0.76	0.95				**Q6-2**	2.08	0.91	0.72		0.98		
Q4-3	2.54	0.83	0.71	0.91				**Q6-3**	1.93	0.92	0.71		0.96		
Q4-4	2.64	0.82	0.74	0.78				**Q6-4**	2.08	0.93	0.65		0.92		
Q4-5	2.32	0.88	0.70	0.66				**Q6-5**	2.35	1.03	0.49		0.36		
Q4-6	2.87	0.98	0.60	0.27				**Q6-6**	1.83	0.82	0.75		0.85		
Q4-7	3.58	0.94	0.46	0.06		0.33		**Q6-7**	2.16	0.88	0.79		0.82		
Q4-8	2.29	0.93	0.75	0.92				**Q6-8**	2.11	0.90	0.77		0.92		
Q4-9	2.46	1.01	0.66	0.72				Q6-9	2.77	1.22	0.46			0.49	
Q4-10	2.58	0.79	0.70	0.69				Q6-10	2.89	0.91	0.54			0.35	
Q4-11	2.50	0.95	0.76	0.72				**Q6-11**	2.81	0.97	0.63		0.34	0.39	
Q4-12	2.20	1.05	0.65	0.45	0.37			Q7-1	2.46	0.90	0.70		0.31		
Q4-13	1.59	0.88	0.61	0.57	0.35			**Q7-2**	2.69	0.86	0.69			0.51	
Q4-14	2.66	0.89	0.68	0.49				Q7-3	3.56	1.01	0.66			0.87	
Q4-15	2.38	0.92	0.76	0.75				**Q7-4**	2.84	0.98	0.68			0.64	
Q4-16	2.46	0.94	0.69	0.62				**Q7-5**	2.88	0.95	0.77			0.75	
Q4-17	2.20	0.96	0.68	0.72				Q7-6	2.93	0.92	0.70			0.67	
Q4-18	2.36	0.82	0.82	0.98				**Q7-7**	3.65	1.01	0.68			0.90	
Q4-19	2.54	0.97	0.76	0.72				**Q7-8**	2.81	0.88	0.69			0.71	
Q5-1	2.64	0.95	0.64	0.34			0.34	Q7-9	2.57	0.99	0.66				
Q5-2	2.95	1.04	0.68				0.63	Q7-10	2.28	0.95	0.63	0.36			
Q5-3	2.66	1.05	0.71				0.66	Q7-11	2.74	0.84	0.70			0.59	
Q5-4	3.50	1.11	0.66				0.88	**Q7-12**	3.39	1.02	0.61			0.72	
Q5-5	3.53	1.03	0.61				0.86	**Q7-13**	3.58	0.99	0.37			0.71	
Q5-6	2.93	0.91	0.77				0.77	**Q7-14**	3.61	0.99	0.54			0.76	
Q5-7	2.70	0.94	0.60		0.36		0.32	Q7-15	2.51	0.91	0.61				
Q5-8	2.91	1.06	0.75				0.72					Factor Correlations			
Q5-9	2.61	1.00	0.73				0.49						F1	F2	F3
Q5-10	2.62	0.84	0.61				0.36					F2	0.71		
Q5-11	2.71	0.95	0.60									F3	0.70	0.63	
Q5-12	2.88	0.95	0.65				0.40					F4	0.66	0.60	0.69

Note. Factor loadings less than 0.30 are omitted. Bolded items were retained for expert review two and CFA. M = item mean (item difficulty), SD = item standard deviation, ITCc = item to total correlation without item included for hypothesized item grouping (e.g., items Q4-x, Q5-x, etc. were item groups); and F1-F4 = extracted factor with standardized factor loading.

above 0.3 on any factor, (2) the item loaded on more than one factor, (3) the item grouped with an unexpected set of items, and/or (4) the item content was vague. After applying these criteria, the items bolded in Table 1 were retained for use in the second content expert review and CFA.

Items Q5-1 and Q6-11 satisfied one or more of the exclusion criteria but were retained for further analyses due to item content being deemed necessary to adequately cover the construct domains of interest.

The feedback from the second content review was combined with the statistical evidence from the EFA to develop the four-factor CFA model shown in Figure 1a. The estimated model did not fit these data well ($\chi^2(659) = 1448.6, p < .001$, CFI $= 0.84$, RMSEA $= 0.06$, SRMR $= 0.08$). We investigated potential sources of misfit using residuals (Maydeu-Olivares & Shi, 2017), modification indices (Sörbom, 1989), and ROPE probability approximations (REMOVED FOR PEER REVIEW). Using the statistical evidence from these local fit methods and the suggestions from content experts on which items were potentially overlapping in meaning, we removed Q4-1, Q4-2, Q4-8, Q4-10, Q4-16, Q4-17, Q5-4, Q5-8, Q6-1, Q6-3, Q6-4, Q7-12, and Q7-13. Additionally, the proposed model underestimated the relationship between Q4-3 and Q4-4; items that both contain the word "effective" likely led to the high correlation between the item responses. We added a residual covariance to account for this similarity in wording. Other residual covariances were identified similarly, and were only retained in the final model if the within factor item wording was similar (i.e., an item wording method effect; Horan, DiStefano & Molt, 2003). Item Q5-12 ("encourages individualized assessment") was identified as potentially cross-loading on the Interaction and Engagement factors, and Q6-11 ("facilitates student interaction with course content") was identified as potentially cross-loading with Engagement, Interaction, and Student-Centered factors. The potential need for cross-loadings indicates that these items were correlated with responses to many items on other factors, and we interpreted this as respondents seeing these items as important in all aspects of learning. We decided not to modify these items given that



(a) Initial CFA Model *(b) Modified CFA Model*

Figure 1. *Proposed and modified CFA model for POOLS*

experts suggested these items were most appropriate for measuring the factor originally indicated. Additional information for all modifications and the supporting technical details are provided in our supplemental material but removed here for brevity. The modified factor model is shown in Figure 1b.

The results of estimating the final model shown in Figure 1b are reported in Table 2. We found that this reduced model fits these data better ($\chi^2(264) = 540.6, p < .001$, CFI $=$ 0.90, RMSEA $= 0.06$, SRMR $= 0.06$). Investigating the potential sources of the misfit in the reduced model led again to Q5-11 and Q6-12 as cross-loading, but again we refrained from breaking simple structure (one item per factor). The hypothesized model in Figure 1b is the most interpretable representation of these items given the available information. Although the

Table 2. CFA model results show subscales have adequate reliability

Item	λ_{STD}	λ_{UNSTD}	SE	95% CI LL	95% CI UL	ψ
Effective Learning ω^2 = 0.77; 95% CI (0.73, 0.80)						
Q4-3	0.74	1[a]				0.45
Q4-4	0.77	1.04	0.05	0.94	1.14	0.41
Q4-5	0.76	1.05	0.08	0.90	1.20	0.42
Q4-9	0.70	1.08	0.09	0.89	1.26	0.51
Q4-11	0.77	1.16	0.08	1.00	1.33	0.41
Q4-15	0.72	1.00	0.07	0.86	1.14	0.49
Q4-18	0.81	1.02	0.07	0.88	1.15	0.35
Student-Centered Learning ω^2 = 0.67; 95% CI (0.61, 0.73)						
Q5-1	0.67	1[a]				0.55
Q5-2	0.67	1.07	0.10	0.88	1.26	0.55
Q5-3	0.69	1.12	0.10	0.93	1.31	0.53
Q5-5	0.64	1.07	0.11	0.85	1.29	0.59
Q5-6	0.72	1.04	0.10	0.85	1.24	0.48
Q5-12	0.64	1.01	0.09	0.83	1.20	0.60
Interactive Learning ω^2 = 0.73; 95% CI (0.67, 0.79)						
Q6-2	0.66	1[a]				0.57
Q6-5	0.50	0.93	0.12	0.69	1.16	0.75
Q6-6	0.81	1.06	0.09	0.87	1.25	0.35
Q6-7	0.85	1.25	0.12	1.01	1.49	0.27
Q6-8	0.78	1.09	0.09	0.92	1.27	0.39
Q6-11	0.68	1.11	0.13	0.86	1.36	0.54
Engaged Learning ω^2 = 0.66; 95% CI (0.61, 0.72)						
Q7-2	0.77	1[a]				0.41
Q7-4	0.68	0.93	0.07	0.80	1.07	0.54
Q7-5	0.78	1.07	0.08	0.92	1.22	0.40
Q7-7	0.63	0.98	0.10	0.78	1.18	0.60
Q7-8	0.75	1.03	0.08	0.87	1.18	0.44
Q7-14	0.57	0.87	0.10	0.67	1.07	0.67

Factor Correlations and factor variances on diagonal					Residual Correlations	
	EL	SC	IN	EN	Q4-3 with Q4-4	0.38
EL	0.43				Q5-2 with Q5-6	0.29
SC	0.67	0.38			Q5-5 with Q5-6	-0.13
IN	0.74	0.65	0.39		Q6-2 with Q6-8	0.27
EN	0.73	0.82	0.76	0.46	Q7-7 with Q7-8	0.26

Note. [a]Fixed for identification. λ_{STD}= standardized factor loading; λ_{UNSTD}=unstandardized factor loading; SE = standard error; 95% CI LL = lower limit of 95% confidence interval; UL = upper limit; ψ = residual variance; ω^2= McDonald's omega-squared reliability estimate.

statistical fit is less than desirable, we argue that the support from subject matter experts on the

simple structure of the scale provides a sound basis for the proposed model shown in Figure 1b as a good starting point for the use of the POOLS. We especially recommend the use of the POOLS in studies with additional scales.

The results of this initial validation study provide the basis for using the POOLS as an approach to measuring four aspects of perceptions of online learning. All four factors were found to have adequate reliability of at least 0.65 with Effective Learning (ω^2 = 0.77), Student-Centered Learning (ω^2 = 0.67), Interactive Learning (ω^2 = 0.73), and Engaged Learning (ω^2 = 0.66). The intended use of the POOLS is to provide a measure of the perceptions of these four factors of the learning process for each participant. Evidence for the use of a particular individual's scores on these subscales to make decisions about that individual is currently unavailable; therefore, we recommend that scores should be used at an aggregate level over groups of participants to describe the general relationship between these factors and other participant characteristics such as self-efficacy, amount or type of experience with online learning, and personality traits.

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Appendix

POOLS Items

Stem: In your experience with traditional face-to-face (F2F) and online learning environments, when you compare F2F to online learning, you perceive that online learning...

Response Options: (1) Definitely less than F2F; (2) Somewhat less than F2F; (3) About the same as F2F; (4) Somewhat more than F2F; (5) Definitely more than F2F.

Q4-1	permits students to acquire content knowledge.	Q6-1	supports student-to-student interaction.
Q4-2	permits students to develop conceptual understanding.	**Q6-2**	permits students to collaborate on learning tasks.
Q4-3	is effective for learning about the topics in the curriculum.	Q6-3	encourages student-to-student discussions.
Q4-4	is effective for building knowledge.	Q6-4	provides a space for students to work in teams.
Q4-5	supports student achievement.	**Q6-5**	permits one-on-one student interaction with the teacher.
Q4-6	provides effective learning resources.	**Q6-6**	builds community among students.
Q4-7	supports achievement with multi-media content.	**Q6-7**	encourages academic dialogue.
Q4-8	prepares students for high stakes assessments.	**Q6-8**	is collaborative.
Q4-9	prepares students for work.	Q6-9	requires active participation.
Q4-10	accomplishes the goals of the curriculum.	Q6-10	permits teachers to provide timely responses.
Q4-11	promotes higher-order thinking skills as analysis, synthesis, and evaluation.	**Q6-11**	facilitates student interaction with course content.
Q4-12	builds student communication skills.	Q7-1	engages students in meaningful ways.
Q4-13	builds student social skills.	**Q7-2**	connects learning to real world situations.
Q4-14	includes focused assessment and feedback.	Q7-3	builds self-directed learning skills.
Q4-15	effectively assesses student performance.	**Q7-4**	supports project-based learning.
Q4-16	assessments provide teachers with reliable information on student progress.	**Q7-5**	supports creative thinking and innovation.
Q4-17	encourages academic integrity and adherence to intellectual property standards.	Q7-6	engages student agency
Q4-18	is effective for building understanding.	**Q7-7**	engages student self-directed learning.
Q4-19	prepares students for work further education.	**Q7-8**	helps students transfer learning to novel situations.
Q5-1	is student-centered.	Q7-9	is interesting.
Q5-2	offers students choices.	Q7-10	motivates students to learn.
Q5-3	permits differentiation based on student needs.	Q7-11	makes content applicable to real-world contexts.
Q5-4	supports flexible pacing for students.	Q7-12	builds time management skills.
Q5-5	supports learner-customized pacing.	Q7-13	requires time commitment.
Q5-6	aligns instruction to individual learning goals.	**Q7-14**	engages student autonomy.
Q5-7	encourages diverse student perspectives.	Q7-15	stimulates positive attitudes toward learning.
Q5-8	is personalized and adaptive.		
Q5-9	is responsive to students.		
Q5-10	is culturally responsive.		
Q5-11	permits teachers to act as facilitators to student learning.		
Q5-12	encourages individualized assessment (as compared to standardized assessment).		

Note. The final items are bolded.