Amy J. Catalano

MEASUREMENTS IN DISTANCE EDUCATION

A Compendium of Instruments, Scales, and Measures for Evaluating Online Learning

ROUTLEDGE

MEASUREMENTS IN DISTANCE EDUCATION

As more postsecondary faculty become engaged in designing online learning environments, research conducted on distance education program quality becomes increasingly important. *Measurements in Distance Education* is a concise, organized guide to some of the many instruments, scales, and methods that have been created to assess distance education environments, learners, and teachers. Entries are organized according to the qualities these measures attempt to gauge—such as engagement and information retention—and provide summaries of each instrument, usage information, the history of its development, and validation, including any reported psychometric properties. Offering more than fifty different surveys, tests, and other metrics, this book is an essential reference for anyone interested in understanding distance education assessment.

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A Compendium of Instruments, Scales, and Measures for Evaluating Online Learning

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Routledge
Taylor & Francis Group
NEW YORK AND LONDON

First published 2018
by Routledge
711 Third Avenue, New York, NY 10017

and by Routledge
2 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

Routledge is an imprint of the Taylor & Francis Group, an informa business

Library of Congress Cataloging-in-Publication Data
Names: Catalano, Amy J., 1976– author.
Title: Measurements in distance education : a compendium of instruments, scales, and measures for evaluating online learning / Amy J. Catalano.
Description: New York, NY : Routledge, 2018. | Includes bibliographical references and index.
Identifiers: LCCN 2017047222 (print) | LCCN 2018000989 (ebook) | ISBN 9781315229447 (eBook) | ISBN 9781138714472 (hbk) | ISBN 9781138714465 (pbk) | ISBN 9781315229447 (ebk)
Subjects: LCSH: Education, Higher—Computer-assisted instruction—Evaluation. | Internet in higher education—Evaluation. | Distance education—Evaluation. | Web-based instruction—Evaluation. | Educational tests and measurements.
Classification: LCC LB2395.7 (ebook) | LCC LB2395.7 .C437 2018 (print) | DDC 371.35/8—dc23
LC record available at https://lccn.loc.gov/2017047222

ISBN: 978-1-138-71447-2 (hbk)
ISBN: 978-1-138-71446-5 (pbk)
ISBN: 978-1-315-22944-7 (ebk)

Typeset in Sabon
by Florence Production Ltd, Stoodleigh, Devon, UK

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INTRODUCTION

DISTANCE LEARNING IN POSTSECONDARY EDUCATION

The number of courses offered in a distance learning (DL) format has increased greatly in the last decade. Allen and Seaman (2015) report a year-to-year increase of 3.9 percent of the number of students in the U.S. participating in distance education courses. Nearly six million students (28 percent of all students taking any post secondary course) took at least one distance education course in 2015. Public postsecondary institutions report the greatest number of DL students. Despite these increases, academic leaders report that blended learning (online and classroom learning) is superior to fully online courses. Distance education has also expanded to include informal or non-credit-bearing experiences, particularly in the form of Massive Online Open Courses (MOOCs), as well as K-12 learning.

The research base on what makes for effective teaching and engaging learning environments in traditional face-to-face (F2F) classrooms is vast and comprehensive. The literature on effective teaching in online learning is also considerably well documented. For example, Bernard et al. (2004) found mixed results in a meta-analysis of studies investigating the efficacy of F2F as compared with distance education. The analysis of 232 studies, from 1985 to 2002, revealed that some aspects of distance education were more effective than in F2F environments. Further analyses of the studies divided into synchronous vs. asynchronous found favorability for online environment with respect to asynchronous, while synchronous was ideal for F2F classes. However, the motivations of postsecondary institutions for moving programs to an online format is not always led by the best practice for learning literature. Rather, the upswing in online course offerings is in response to the needs of increasingly busy learners, particularly

non-traditional adult learners with jobs and families. These types of learners tend to want convenience and flexibility to take courses when and where it works best for them. To that end, universities are responding with programs to meet these desires. Undergraduate, more traditional, students are also offered online courses more often – these offerings, too, address convenience and conflicting course schedules – but is the format always the best choice for some learners? What are the pre-requisites for engaging in an online learning experience and succeeding? Other motivations include allowing faculty to teach from distant locales; faculty themselves may elect this option for convenience as well as saving money.

The goal of this book is to assist researchers of distance education, both novice and expert, in finding well-developed and valid measures to suit their research questions. A search in any database using the terms "distance education" or "online learning" will yield tens of thousands of results. As an academic librarian, I have a lot of experience reducing overwhelming amounts of research to organized categories of inquiry. The outcome of these efforts resulted in the following compendium of about 70 measures that have been developed and validated using commonly established practices. Research about online learning includes many facets; however, my review of measures in distance education has revealed the following prominent themes in DL research including student engagement, faculty experiences and perceptions, student readiness to learn online, technology use, learning environment evaluation, and other topics. Each chapter will include one- to two-page evaluative entries of each measure covered. The entries will include a summary of the instrument, description of how the measure is used, and description of its development and validation including any reported psychometric properties. The focus of this book is on properly validated measures, thereby relieving the researcher from having to develop his or her own instrument.

Criteria for Inclusion

Although the focus for inclusion in this book is measures used in post-secondary settings, a handful of measures were initially developed for use with high-school students. With respect to validity, the criteria for including instruments were that the development must be explained in some detail and follow conventional methods of developing and writing items. Traditionally, these methods include reviewing the literature on the construct being measured, and consulting or adapting or including items from previously validated measures. Not every researcher is trained in psychometrics, so in the subsequent section I explain the acceptable

psychometric parameters of each test used in validation procedures in this book. Not all instrument developers utilize the same means for validating a measure. And reasonably so, not all measures require the use of the same psychometric tests. Some authors used many types of validation to confirm their instruments and others report reliability coefficients and the results of factor analysis.

While I do not rate any of the measures included in this volume on their level of validity, I leave it to the reader to decide which measures are best for their needs; every instrument included in this book has been validated on some acceptable level.

With respect to publication dates, I limited the retrieval of distance education to those published in the year 2000, which marks the prominence of the wide use of the internet. Prior to that a great deal of distance education focused on correspondence courses, rather than those mediated by technology or computers. Some measures originated in 1999 and were subsequently updated – those were included here as well. In all cases, I checked the wording of the items in the measures to be sure that they reflected modern usage of distance learning platforms.

Search Strategy

I began the quest for instruments to include in this book by searching the databases: Academic search premier, ERIC, Education full text, and PsycInfo/PsycArticles. These are the databases I typically use to do education-related searchs. There are other databases such as Proquest Education, Sage, Science Direct, and many others that would also reveal results suitable for inclusion; however, I prefer the EBSCO interface that allows me to search several relevant databases at once. My first strategy was to use the terms "distance education or online learning or e-learning" AND "development and validation" in order to specifically access development and validation articles. I also searched "development" and "validation" separately. After retrieving the 100 or so articles that resulted from this search, I also searched "'distance education or online learning or e-learning' AND 'instrument or measure or questionnaire or survey or test or assessment'"; however, this retrieved a very large body of results, many of which did not include valid measures or the discussion of the development of the instrument used in the study. However, perusal of these results revealed a good number of instruments that were included in this volume. Lastly, I consulted Barbara Mean's (2009) *Evaluation of evidence-based practices in online learning: A meta-analysis and review*

of online learning studies, Moore's (2013) *Handbook of distance education*, and Bernard et al.'s (2004) comparison of traditional vs online learning.

UNDERSTANDING VALIDITY AND RELIABILITY

It is not the purview of this monograph to instruct on methods of psychometric evaluation of instruments; however, the following is a tutorial on the most commonly accepted barometers of validity and reliability used by authors of measures included in this book. As noted previously, it is up to the reader to select a measure based on their own criteria for validity; however, an instrument's inclusion in this book indicates that it has been evaluated for validity at some acceptable level. Below I review the different types of validity, although often content and construct validity are sufficient for most researcher's uses. However, depending on the desired or assessed outcomes it may be essential to assure predictive validity to ensure that the measure is truly useful for predicting the outcome of interest. In all, it depends on the stakes and the use of the instrument. Additionally, I provide the acceptable ranges for most tests used in this volume.

Reliability

Reliability is the extent to which a scale consistently measures a construct. It is frequently said that scales can often be highly reliable, but not valid at all. That is, participants can collectively and consistently perform similarly on a scale every time it is administered, but that does not assure that the measure is testing what it is intended to measure. There are several statistical tests the test developer may use to calculate reliability. To evaluate internal consistency reliability, how well items on a test relate to each other, Cronbach's alpha (CA) or Kuder-Richardson 20 are most often used. A high value indicates high reliability. According to George and Mallery (2003) anything above 0.90 is excellent, 0.8–0.89 is good, 0.70–0.80 is acceptable, 0.60–0.70 is questionable. Anything lower than 0.60 should not be accepted.

Other types of reliability include split half and inter-rater, however, those two methods were rarely, if at all, used with tests in this book.

Types of Validity

Part of assessing validity is to also assess the rigor with which the measure was developed. Several methods are employed by most authors to develop

tests. After identifying the construct, or topic, to be studied, the author conducts a literature review in order to determine what contributing factors are most often associated with the construct. Through this literature review the author is, first, able to identify other similar measures, noting its weaknesses, strengths, and any gaps that need to be filled. Second, the author is able to justify the items to be written for the measure with confirmation by the research that these factors do indeed make up the construct. Often authors will adapt or revise items from other measures to compose a new scale that suits a slightly different purpose. In one way, the literature review partially assures *content validity* (see below) as well as *construct validity*. After developing items, the authors will go through some procedure of making sure they are clear and reflect the content by calling in experts in either the content area or test development. These experts will review the test using various methods, many of which are reported within this book. This is another method of assuring content validity. Below is a brief description of each type of validity.

Content Validity

Content validity is the assurance that the test covers the construct or subject matter it is intended to cover. As noted above, this is done through literature review and expert review of the content. Often an expert panel will review items developed for a scale and match them to the factor intended.

Construct Validity

Construct validity is often considered the most important type of validity that an instrument must demonstrate (Gay et al., 2009). Construct validity assures that the instrument measures the construct intended. Although this is somewhat like content validity, it can be statistically assessed through factor analysis. A construct is an idea that conceptualizes several elements that comprise a variable. For example, motivation (a construct or latent variable) may comprise self-efficacy, locus of control, and extrinsic and intrinsic factors. Construct validation procedures would assess that these latter factors do indeed compose motivation. Construct validity may be somewhat assured through literature review, but most often factor analysis is conducted. A factor analysis will determine how many factors are extracted statistically from a data set of responses to a scale. These factors generally emerge when items "load" on a particular factor. That is, for each factor, several items will cluster statistically. Generally, researchers must put a loading cutoff coefficient. This cutoff

should be based on the size of the sample according to Hair et al. (1998). The higher the loading (from 0–0.99), the more associated with the factor the item is. While 0.30 is a very low cutoff loading, some authors will consider using this value. More acceptable cutoffs are at 0.50–0.60 or higher. For a sample of 100 participants for example, the cutoff should be at 0.55.

Other statistical measures used in factor analysis include the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. This value tells the researcher whether the data is acceptable for factor analysis. A value greater than 0.50 is considered acceptable (Tabachnick & Fidell, 2001).

Bartlett's test of sphericity is another measure evaluated along with the KMO. If the value is significant, then it is considered acceptable.

Another value to be considered in factor analysis is variance explained. Generally, the higher the variance, the better the items on the scale represent the dependent variable or the outcome. Variance is the degree to which the scale accounts for the distribution of scores. Another way to state this is that if a scale that purports to measure self-efficacy only explains 40 percent of the variance in scores, then 60 percent of the variance is not explained by anything on the instrument; rather, it is explained by outside factors. Having this unexplained variance does little to demonstrate that a variable is measured by a scale.

Face Validity

Face validity is one of the most easily assessed forms of validity. It is the degree to which the participant subjectively views the measure. Generally, face validity is assessed by asking participants or students to judge the clarity or ease of reading of a scale.

Convergent and Discriminant Validity

These types of validity are a part of construct validity. Convergent validity is assured when two (or more) scales that measure the same construct are highly correlated. Conversely, discriminant validity is when measures that should not be related are not correlated. Trochim (2008) states that if a scale developer can demonstrate both convergent and discriminant validity, then construct validity has been confirmed.

Goodness of Fit Statistics

When researchers use structural equation modeling or some forms of factor analysis, they may also produce goodness of fit statistics. These statistics indicate that the model is indeed indicative of the construct being

measured. Several indices and their acceptable ranges include chi-square, chi-square divided by degree of freedom, Comparative Fit Index (CFI), Tucker and Lewis Index (TLI), Standardized Root Mean Square Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA). Within the entries that report the results of these tests I indicate the degree to which they are acceptable or not.

Finding Full Text

I only included measures in this book where the reader could easily find the full text of the instrument. The full text of the items in a measure is almost always available in tables within the text of the article in which the development and validation is reported, usually in the form of the reported "loadings" for each item. The full instrument can also often be found in the appendix. This is sufficient information for the reader to recreate the survey, as long as they note the type of Likert scale to use. When there was an insufficient amount of the survey in the article, I wrote to the author to ask permission to publish their survey. Many authors happily consented, and many authors also did not respond to my request. Therefore, if no full text of items (from which a reader could reproduce the scale) appeared in the article, and/or the author did not give me permission to publish the scale, then they were not included in this book. Accordingly, there are about a dozen or so full text surveys in this book for which I was generously granted permission to reproduce. Copyright is retained by these authors.

Asking for Permission

Despite the extent of my efforts to find full text for readers, any reader wishing to use, replicate, adapt, or abstract from a text (e.g., take a few items from one measure for use in their own) they MUST ask the permission of the original author. If no response is received or the author and/or his or her colleagues are not reachable, are retired, or deceased, then the reader wishing to use the scale should attempt to contact the journal or the author's institution. In any event, researchers must give credit to the original author. Additionally, the researcher must be cautious about publishing a new scale that comprises parts of other scales if they have not been given permission. The APA for example, is very diligent about going after researchers who have used a measure (or any other item) published by an APA journal without permission. My advice does not constitute or replace legal advice; rather it is description of common practices when determining how to use or adapt a published scale for one's own use.

The topics covered in this book represent most of the available literature on DL. These topics cover student engagement, including social presence models; readiness to learn in online environments and evaluations of student success; student and faculty satisfaction with DL; technology acceptance models; and retention.

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CHAPTER 1

Engagement and Satisfaction

Student engagement is essential to success in online courses. Without being engaged, students can feel isolated and disconnected (Dixson, 2015). Engagement in the learning environment is characterized by "the extent to which students actively engage by thinking, talking, and interacting with the content of a course, the other students in the course, and the instructor" (https://olj.onlinelearningconsortium.org/index.php/olj/article/view/561[retrieved October 20, 2017]).

Many instruments include at least one section to capture some version of engagement. Large-scale measures such as the National Survey of Student Engagement (NSSE) are commonly used by postsecondary institutions to gauge retention factors. In 2008 items were added to the NSSE to assess engagement in distance education. Aspects of engagement and satisfaction are also mitigated by social presence, and therefore those scales are represented in this chapter as well.

*

THE ONLINE STUDENT ENGAGEMENT SCALE (OSE)

Source: Dixson, M. D. (2015). Measuring student engagement in the online course: The Online Student Engagement Scale (OSE). *Online Learning*, *19*(4).

Purpose: The OSE is intended to measure the degree to which students are engaged in their online courses. Students tend to feel disconnected from their instructor and peers in distance education. Therefore, if instructors can gauge the level of engagement in their online courses, they may be able to adjust learning activities and interactions with their students. This scale may also be used to collect data that would improve course design initiatives on college campuses as well as provide information on teaching effectiveness.

Description: The OSE is a self-report measure of engagement consisting of 20 items representing four factors. The factors include: skills (keeping up with assigned work and reading carefully), emotion (exhibiting the desire to learn), participation (actively participating in discussion and helping other students), and performance (doing well in the class). Questions are rated on a five-point Likert scale from "not at all characteristic of me" (1) to "very characteristic of me" (5).

Development and validation: The initial version of the OSE, as reported in Dixson (2010) was created based on the following steps: a review of existing instruments measuring student engagement (most notably the Student Course Engagement Questionnaire [SCEQ; Handelsman et al., 2005]); a focus group's review of those instruments with a discussion on how the measures should be adapted for DL environments; a pilot of the instrument derived from the focus group; and subsequent testing. The focus group was comprised of five online instructors who identified 30 behaviors that would represent the four factors of engagement as described by Handelsman et al. (2005) and adapted them for the distance education environment. The initial instrument was comprised of 30 items. The instrument was piloted with 32 students in an online course. Initial reliability was very strong (CA = 0.95). Concurrent validity was supported with a significant positive correlation, with two global items measuring social presence and teacher presence.

Further testing was conducted with a larger group of 186 students from 38 courses. Factor analysis resulted in 19 of the items loading at 0.60 or

higher. Four factors emerged that included skills, emotion, participation, and performance. The CA for this round of testing was 0.91.

The OSE has been further validated by Dixson (2015) by correlating the self-report measure of engagement (the OSE) with data from the online course management system. The data tracked with the CMS include observational behaviors (reading emails, reading posts in the discussion board, and viewing other course documentations) and application behaviors (posting messages, taking tests, and writing emails). Dixson reports that the OSE was significantly correlated with application-type behaviors. Dixson also reports that, unexpectedly, students who "spontaneously reported multiple channels for communicating with other students and the instructor" reported higher levels of engagement in the course (2015).

Full text: Full text of the OSE follows.

*

OSE

One of your online instructors forwarded the information about this study to you, please fill out the survey with that course in mind.

What is the name of that course? _____

Who is the instructor? _____

Age: _____

Sex: ☐ Female ☐ Male ☐ Identifying as Other

Rank: ☐ Fresh ☐ Soph ☐ Junior ☐ Senior ☐ Graduate ☐ Other

Course is:
- ☐ required for major
- ☐ required for minor
- ☐ meets a college requirement
- ☐ meets a general education requirement
- ☐ elective
- ☐ other _____

Within that course, how well do the following behaviors, thoughts, and feelings describe you? Please answer using the following scale:

1. not at all characteristic of me
2. not really characteristic of me
3. moderately characteristic of me
4. characteristic of me
5. very characteristic of me*

---

1. Making sure to study on a regular basis: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
2. Putting forth effort: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
3. Staying up on the readings: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
4. Looking over class notes between getting online to make sure I understand the material: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
5. Being organized: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
6. Taking good notes over readings, powerpoints, or video lectures: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
7. Listening/reading carefully: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
8. Finding ways to make the course material relevant to my life: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
9. Applying course material to my life: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

10. Finding ways to make the course interesting to me: ☐1 ☐2 ☐3 ☐4 ☐5

11. Really desiring to learn the material: ☐1 ☐2 ☐3 ☐4 ☐5

12. Having fun in online chats, discussions or via email with the instructor or other students: ☐1 ☐2 ☐3 ☐4 ☐5

13. Participating actively in small-group discussion forums: ☐1 ☐2 ☐3 ☐4 ☐5

14. Helping fellow students: ☐1 ☐2 ☐3 ☐4 ☐5

15. Getting a good grade: ☐1 ☐2 ☐3 ☐4 ☐5

16. Doing well on the tests/quizzes: ☐1 ☐2 ☐3 ☐4 ☐5

17. Engaging in conversations online (chat, discussions, email): ☐1 ☐2 ☐3 ☐4 ☐5

18. Posting in the discussion forum regularly: ☐1 ☐2 ☐3 ☐4 ☐5

19. Getting to know other students in the class: ☐1 ☐2 ☐3 ☐4 ☐5

20. How engaged are you in this course?

Not at all engaged ☐ ☐ ☐ ☐ ☐ Extremely engaged

21. How engaged are you in this course compared to other courses (online or traditional) you are taking?

Not at all engaged ☐ ☐ ☐ ☐ ☐ Extremely engaged

22. What assignments, activities, requirements of this course helped / encouraged / required you to interact with other students (just list one or two)?

23. How well do you feel you have gotten to know other students in this class?

Not at all ☐ ☐ ☐ ☐ ☐ Fairly well

24. What assignments, activities, requirements of this course helped / encouraged / required you to really think about and be interested in the content of the course (just list one or two)?

25. How well do you feel you know your instructor?

Not at all ☐ ☐ ☐ ☐ ☐ Fairly well

*Adapted from Handelsman, M. M., Briggs, W. L., Sullivan, N., and Towler, A. (2005). A measure of college student course engagement. *The Journal of Educational Research*, 93(3), 184–191.

Reprinted with permission, Dixson, M. D. (2015). Measuring student engagement in the online course: The Online Student Engagement Scale (OSE). *Online Learning, 19*(4).

SOCIAL PRESENCE SCALE

Source: Gunawardena, C. and Zittle, F. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment: *American Journal of Distance Education, (11)*3.

Purpose: This scale represents the earliest attempt at creating a social presence survey for computer-mediated environments. Because social presence is deemed a significant factor in instructional effectiveness, its examination in DL contexts is essential for ensuring quality online learning.

Description: The social presence subscale was developed as part of a larger scale used to assess reactions to computer mediation communications. The subscale includes 14 items that reflect the concept of "immediacy" which is defined as answered on a five-point Likert scale from strongly disagree (1) to strongly agree (5). It contains four reverse coded items. Examples of items include "Discussions using the medium of CMC [computer-mediated communication] tend to be more impersonal than face-to-face discussions," and "I felt comfortable interacting with other participants in the conference" (p. 15).

Development and validation: The social presence subscale was developed from the GlobalEd scale created to assess the responses of participants in a Global education conference to computer-mediated instruction. The GlobalEd questionnaire was a 61-item measure on a five-point Likert scale. The social presence subscale itself includes 14 items. A stepwise regression procedure demonstrated that the social presence subscale contributed to 60 percent of the variance in the overall scale. CA of the subscale was a value of 0.88.

Full text: Full text of the items appears in the text of the source.

*

SOCIAL PRESENCE AND PRIVACY QUESTIONNAIRE (SPPQ)

Source: Tu, C. (2002). The measurement of social presence in an online learning environment. *International Journal on E-Learning*, *1*(2), 34–45.

Purpose: Social presence describes awareness among participants (both peers and instructors) in an online setting, and has been argued as an essential component for student engagement in a distance education context. This measure represents one of the earliest attempts at measuring social presence with respect to computer-mediated instruction. Additionally, the questionnaire examines student perceptions of privacy in these contexts because it is one of the factors affecting online communications.

Description: The SPPQ comprises two scales: attitudes toward computer-mediated instruction (CMC) and online privacy, with 17 and 13 items respectively, and 12 demographic questions. The items are answered on a five-point Likert scale.

Development and validation: The development of the measure began with a review of existing measures on social presence including those developed by Short et al. (1976), Osgood et al. (1957) and Gunarwardena and Zittle (1997). Primarily, the SPPQ was based on the CMC attitude instrument (Steinfeld, 1986) and perceived privacy (Witmer, 1997). Adaptations and additions were made according to recommendations derived from the literature review and resulted in the piloted 59-item version instrument. The following eight objectives were reflected in the instrument: social presence, privacy, utility of computer-mediated communication, ease of use, interactivity, how online language cues were used, experience and comfort with computer-mediated communication, and demographic information.

Content validation was achieved through having five experts in the field of social presence and privacy match the items on the questionnaire to the above objectives. The experts matched 58–80 percent of the items. After these procedures, further revisions were completed.

Construct validation was demonstrated through factor analysis on the responses of 310 inservice and preservice teachers. EFA with orthogonal and oblique rotations were employed. Analysis revealed five factors: social context, online communication, interactivity, system privacy, and feeling of privacy that accounted for 82.33 percent of the variance. All

but three items loaded at or above 0.45. Cronbach's alphas for these five factors ranged from 0.74 to 0.85.

Full text of the source appears below with permission.

*

Computer-Mediated Communication (CMC) Questionnaire

The following questionnaire has been developed to investigate your attitude toward Computer-Mediated Communication (CMC), including e-mail, and the NetForum. You are to consider your course related use of Computer-Mediated Communication only. You will be presented with a statement about Computer-Mediated Communication. Choices of responses are listed under each statement. The following descriptions apply to entire questionnaire:

Your responses will remain anonymous. Please answer each item.

Thank you for your assistance!

Part I:
Please read each statement carefully; then indicate the degree to which you **Agree/Disagree** with the statement as it relates to e-mail, and the NetForum, by selecting the appropriate answer.

1. Computer-Mediated Communication messages are social forms of communication.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

2. Computer-Mediated Communication messages are an informal and casual way to communicate.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

3. Computer-Mediated Communication messages convey feeling and emotion.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

4. Computer-Mediated Communication messages are impersonal (do not have qualities or characteristics).

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

5. Computer-Mediated Communication is not confidential enough to use to communicate personal and/or sensitive information.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

6. Computer-Mediated Communication is a sensitive means of communicating with others.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

7. Using Computer-Mediated Communication to communicate with others is pleasant.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

8. The replies to my Computer-Mediated Communication messages are immediate.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

9. Users of Computer-Mediated Communication are normally responsive to messages.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

10. The language people use to express themselves in online communication is stimulating.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

11. It is difficult to express what I want to communicate through Computer-Mediated Communication.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

12. The language used to express oneself in online communication is meaningful.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

Continued

13. The language used to express oneself in online communication is easily understood.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

14. I am comfortable participating, if I am familiar with the topics.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

15. I am uncomfortable participating, if I am not familiar with the topics.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

16. I am comfortable communicating with a person who is familiar to me.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

17. I am comfortable communicating with a person who is not familiar to me.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

Please read each statement carefully; then indicate the degree to which you feel the statement is **Likely** / **Unlikely** as it relates to e-mail, and the NetForum, by selecting the appropriate answer.

18. What is the likelihood that a computer system operator might read and/or re-post messages sent to or from you?

Extremely Likely	Likely	No Opinion	Unlikely	Extremely Unlikely
☐	☐	☐	☐	☐

19. What is the likelihood that someone else might read and/or re-post messages sent to or from you?

Extremely Likely	Likely	No Opinion	Unlikely	Extremely Unlikely
☐	☐	☐	☐	☐

20. What is the likelihood that you might accidentally send message(s) to someone other than the intended recipients(s)?

Extremely Likely	Likely	No Opinion	Unlikely	Extremely Unlikely
☐	☐	☐	☐	☐

21. What is the likelihood that someone might obtain personal information about you from the messages you send and/or receive?

Extremely Likely	Likely	No Opinion	Unlikely	Extremely Unlikely
☐	☐	☐	☐	☐

For each item below, please read the statement carefully and then indicate your response to the statement as it relates to e-mail, and the NetForum, by selecting the appropriate answer.

22. Do you consider your online communication to be technically **RELIABLE** (e.g., free of system or software errors that might compromise the reliability of your online messages reaching ONLY the target destination)?

Extremely Reliable	Fairly Reliable	Neither Reliable nor Unreliable	Fairly Unreliable	Extremely Unreliable
☐	☐	☐	☐	☐

23. How **PRIVATE** are your messages on Computer-Mediated Communication?

Extremely Private	Private	No Opinion	Public	Extremely Public
☐	☐	☐	☐	☐

24. How **IMPORTANT** is privacy of a Computer-Mediated Communication?

Extremely Important	Fairly Important	Neutral	Fairly Unimportant	Extremely Unimportant
☐	☐	☐	☐	☐

25. How **SECURE/SECRET** is your online participation?

Extremely Secure	Fairly Secure	Neither Risky nor Insecure	Fairly Insecure	Extremely Insecure
☐	☐	☐	☐	☐

26. How **RISKY** is it to share personal and sensitive topics online?

Extremely Risky	Fairly Risky	Neither Risky nor Safe	Fairly Safe	Extremely Safe
☐	☐	☐	☐	☐

27. Do you know of any instance where someone has been personally or professionally embarrassed because of their online activities?

Yes	No
☐	☐

Continued

28. Which of the following statements most closely reflects how you feel about the possibility of you even being personally or professionally embarrassed through your online participation?

It'll never happen to me	It's not likely to happen to me	I don't think about it and have no feeling	It's likely to happen to me	It's a sure thing that it'll happen to me
☐	☐	☐	☐	☐

29. What is your professional **RELATIONSHIP** to other participants with whom you communicate?

They are close friends	They are casual friends	They are regular acquaintances	They are casual acquaintances	I don't have a relationship with them
☐	☐	☐	☐	☐

30. If you are able to use online messages anonymously, how **CONCERNED** are you that your identity will be traced?

Extremely Concerned	Quite Concerned	Concerned	A little Concerned	Not Concerned at all
☐	☐	☐	☐	☐

Part II:

1. How proficient are you in using Computer-Mediated Communication? (e.g., expertise with software and system commands, keyboard skills, etc.)

	Expert	Above Average	Average	Below Average	Novice
E-mail	☐	☐	☐	☐	☐
Threaded Discussion	☐	☐	☐	☐	☐
Real-time chat	☐	☐	☐	☐	☐

2. How many years have you been using the different forms of Computer-Mediated Communication?

E-mail	Years (EX: 1; 2.5; 3 etc.)
Threaded Discussion	Years
Real-time chat	Years

3. How many hours do you spend on course related Computer-Mediated Communication each week?

E-mail	Years (EX: 1; 2.5; 3 etc.)
Threaded Discussion	Years
Real-time chat	Years

4. How many years have you been using the Internet?

Internet	Years (EX: 1; 2.5; 3 etc.)

Part III:

1. Gender

Male	Female
☐	☐

2. You are

Under 18	18–25	26–35	36–45	45+
☐	☐	☐	☐	☐

3. Estimate of your level of computer expertise.

No experience	Novice	Intermediate	Expert
☐	☐	☐	☐

4. Where do you presently use computer? (Check all that apply)

Home	Computer Lab	Library or Media Center	Classroom	Office
☐	☐	☐	☐	☐

5. What is your predominant ethnic background?

Caucasian	African American	Latino	American Indian or Alaska Native	Asian & Pacific Islander	Other
☐	☐	☐	☐	☐	☐

6. Which group(s) are you affiliated with? (Check all that apply)

ED220i2	ED220P	ED238	ED236	ED239
☐	☐	☐	☐	☐

7. **What is your instructor's name and gender?**

Instructor I	Male	☐	Female	☐
Instructor II	Male	☐	Female	☐
Instructor III	Male	☐	Female	☐
Instructor IV	Male	☐	Female	☐

Submit Reset

Thanks for your participation.

Reprinted with permission, Tu, C. (2002). The measurement of social presence in an online learning environment. *International Journal on E-Learning, 1*(2), 34–45.

SOCIAL PRESENCE IN ONLINE CLASSROOMS

Source: Wei, C.-W., Chen, N.-S., and Kinshuk (2012). A model for social presence in online classrooms. *Educational Technology Research & Development*, *60*(3), 529–545. http://doi.org/10.1007/s11423-012-9234-9 (retrieved October 20, 2017).

Purpose: Because learners in online courses typically report feeling isolated, enhancing social presence, the feeling of a connection with both instructors and fellow students, can mitigate negative experiences causing low engagement. Feelings of "togetherness" can facilitate participation in activities in online courses. This instrument represents a model of measuring social presence that will allow instructors and course designers to determine causes of social presence in online courses.

Description: The scale includes six demographic questions and 28 items, four items for each of the seven subscales: user interface, social cues, co-presence, intimacy, immediacy, learning interaction, and learning performance. Participants are asked to rate their agreement with each item on a scale of 1 (strongly disagree) to 5 (strongly agree). Examples of items include "I often discussed learning issues with others in the online classroom" (learning interaction), "I found myself respected by others in the online classroom" (immediacy), and "I received considerable emotional support from others in the online classroom" (pp. 542–543).

Development and validation: After conducting a literature review, the authors determined that verbal, audio, and visual cues were the appropriate variables related to social presence. Their model began with five constructs, including user interface, social cues, social presence, learning interaction, and learning performance. Social presence was operationalized as co-presence (the feeling of being together in a remote environment), intimacy (the degree to which people make relationships with others), and immediacy (the perception of the intensity of interactions with others). An initial version of the instrument was designed to measure the constructs in the model (four constructs and the three subconstructs of social presence). Ten experts who had more than five years' experience of teaching and conducting research on online learning reviewed the questionnaire. The survey was then piloted with 148 students. The reliability coefficient for each construct ranged between a CA of 0.812 and 0.924. The reliability of the constructs co-presence, intimacy, and

immediacy (representing the construct social presence) was a CA of 0.901. A CFA revealed that each item loaded at 0.70 or above. The item to total correlation coefficients ranged from 0.522 to 0.754. Construct validity was established by deterring convergence and discriminability. The authors reported that the average variance extracted exceeded 0.50 and there-fore demonstrated reasonable convergent validity. Discriminability, that one construct is different from others that appear to be similar, was supported in that the constructs had a greater AVE than the coefficients in the same column or row.

Full text access: Full text appears in the source.

*

ONLINE STUDENT CONNECTEDNESS SCALE (OSCS)

Source: Bolliger, D. U. and Inan, F. A. (2012). Development and validation of the Online Student Connectedness Scale. *International Review of Research in Open and Distance Learning, 13*(3), 41–65.

Purpose: Students in online courses tend to be and feel isolated. These feelings can lead to students dropping out of online courses and high attrition overall. The scale was deployed to students at a Turkish university and represents a valid measure to assess student connectedness in the Turkish language.

Description: The OSCS includes 25 items on four scales that include community, comfort, facilitation, and interaction and collaboration, rated on a five-point Likert scale from strongly disagree to strongly agree.

Development and validation: In order to develop the OSCS the authors look at measures that assessed similar constructs including the Social Presence and Privacy Questionnaire (Tu, 2002), Rovai's (2002) Classroom Community Scale, and the doctoral connectedness survey by Terrell, Snyder, and Dringus (2009). The literature review focused on the elements related to student connectedness, including comfort, community, facilitation, and interaction and collaboration. A draft of 78 items was developed which addresses these elements. Additionally, several items were modified from Walker and Fraser (2005) with permission.

The list of items was then reviewed by experts in distance education and instruction technology. The expert panel was asked to associate each item with the corresponding construct and subconstruct, evaluate for clarity, evaluate the definitions of each construct, and recommend items for deletion or addition. This resulted in the removal and revision of several items.

The authors then deployed the survey to English-speaking students and conducted factor analysis on this 48-item version, retaining only items with high factor loadings (note: the authors did not indicate the loading cutoff or related psychometrics). CA for the instrument was 0.98. The English version of the scale was then translated into Turkish. This version was then administered to 146 students enrolled in an online information technology program in Turkey. These data were examined for outliers, linearity, and multicollinearity, prior to performing Principal Component Analysis (PCA). The Bartlett's test was significant and the KMO was

0.935, indicating that the data were appropriate for FA. Additionally, Kaiser's measure of sampling adequacy (MS) was utilized with results of 0.90. CFA with oblim rotation revealed four factors explaining 83.95 percent of the variance. All items loaded at or greater than 0.50. The Turkish version of the OCCS had a CA of 0.97, with the subscale CAs ranging from 0.94 to 0.97.

Full text access: Full text of the scale appears in both English and Turkish in the appendix of the source.

*

STUDENT SATISFACTION SCALE (SSS)

Source: Bolliger, D. U. and Wasilik, O. (2012). Student satisfaction in large undergraduate online courses. *The Quarterly Review of Distance Education, 13*(3), 153–165.

Purpose: The SSS was developed to measure how satisfied undergraduates are with their experience in a DL course that has high enrollment and did not include interactions. These types of courses tend to require students to possess higher levels of self-efficacy and motivation. When course developers understand the variables that facilitate student satisfaction, adjustments can be made with respect to instructional design in order to improve satisfaction.

Description: The SSS includes 20 items on four factors: instructor behavior, learner characteristics, course design, and outcomes. The items are rated on a five-point Likert scale from strongly disagree to strongly agree. Additional items are also included to assess general student satisfaction, as well as demographic questions.

Development and validation: Bolliger and Wasilik focus on the constructs of student satisfaction as the "perceived value" of the student's experience with the course (p. 154). Accordingly, the authors examine variables associated with instructor quality, learner characteristics, course design, learner outcomes, and interactions. While a great deal of research has investigated the roles of social presence and a sense of community in students' satisfaction and engagement, Bolliger and Wasilik note that not all students require or expect these characteristics in online courses.

The authors modified an existing scale originally developed by Bolliger and Halupa (2012). This scale demonstrated an internal reliability of 0.91. Because that scale was created for doctoral students in classes that did include interaction elements, the authors modified it to reflect the characteristics of undergraduate students in courses without interactions. Four experts in the field of distance education and course development reviewed the revised scale. This review resulted in revision of several items. The instrument was then piloted with students in two courses. Results revealed excellent reliability: CA = 0.92.

The scale was then deployed to 213 students in online statistics courses. A total of 115 students responded to the survey. Outliers were deleted from the data resulting in 107 usable instruments. KMO demonstrated

a value of 0.855 and Bartlett's test was significant, both results indicating that the data were appropriate for factor analysis. Maximum likelihood extraction with varimax rotation was conducted on the data. A four-factor model explaining 64.5 percent of the variance was revealed by these procedures. A value of 0.30 was used as a cutoff point for loadings. Reliability coefficients were then recalculated, revealing CA of 0.91 for the entire scale and a range of values from 0.77 to 0.85 for the four subscales.

Full text: Full text of the items appears on Table 3 in the source.

*

SATISFACTION AND QUALITY

Source: Sebastianelli, R., Swift, C., and Tamimi, N. (2015). Factors affecting perceived learning, satisfaction, and quality in the online MBA: A structural equation modeling approach. *Journal of Education for Business, 90,* 296–305.

Purpose: This study describes the development of three scales developed to measure learning, satisfaction, and quality in an online course. The findings of the study suggested that the content of the course was a strong predictor of all three constructs, while instructor–student interactions were related to satisfaction, and student–student interactions and mentoring support impacted perceptions of quality. Although this study focuses on an online MBA, the scales are applicable to other online programs.

Description: The questionnaire consists of demographic-type questions and a section that includes a series of 18 statements rated by the participant on a seven-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). Examples of items include "The content in my online courses adds value to my MBA educational experience," and "Most of my online professors respond to questions in a timely manner" (p. 300).

Development and validation: Based on a review of the best practice in online teaching literature, the authors chose to investigate the student outcomes of perceived learning, satisfaction, and perceptions of quality (Dykman & Davis, 2008; Gaytan & McEwen, 2007; Grandzol & Grandzol, 2006). The scales were developed to specifically assess the factors under the control of faculty that would impact these outcomes. Those factors include course content, course structure, rigor, professor–student interaction, student–student interaction, and online mentoring support.

The source does not describe the development of the individual items, beyond the consultation of the literature; however, the survey was piloted with MBA students in a F2F program who had taken at least one online course. This pilot resulted in the removal of some items, and the revision of others. After these revisions, the instrument was sent to students in an online MBA program as well as students in a F2F program who had taken at least one course online. A total of 169 completed surveys were collected. The data were then evaluated using three structural equation models which linked the three content-related constructs and three interaction

constructs to the student outcomes of quality, satisfaction, and perceived learning. All estimated standardized regression coefficients linking the items to their factors were significant at 0.001 level.

Cronbach's alpha was computed for all six factors; the values were above 0.70 for five of the six, with one at a value of 0.691. Model fit statistics were also computed. An overall goodness of fit measure is chi-square divided by degrees of freedom equal was 2.016, the CFI = 0.883, and the RMSEA = 0.078 – all indicating the model was a good fit.

Full Text: Full text of the scales appears in Table 1 of the source.

*

SATISFACTION QUESTIONNAIRE

Please indicate your level of agreement with the following statements regarding the online MBA program.

1 = strongly disagree
2 = disagree
3 = somewhat disagree
4 = neither agree or disagree
5 = somewhat agree
6 = agree
7 = strongly agree

1. Course content

1. The content in my online courses adds value to my MBA educational experience. ____
2. The content in my online courses is applicable and useful to professional work. ____
3. My online professors design course content to stress important concepts. ____

2. Course structure

4. The weekly overview and objectives clearly identify learning goals to be achieved. ____
5. The consistent format for each course makes it easy for me to access materials I need. ____
6. "Tasks for the week" helps to meet course requirement deadlines. ____

3. Rigor

7. The content in my online courses is challenging. ____
8. The content in my online courses is less rigorous than I expected. ____
9. I don't spend much time studying for online exams. ____

Continued

4. Professor–student interaction

10. My online professors actively facilitate discussion in forums. _____
11. Most of my online professors respond to questions in a timely manner. _____
12. My online professors are very responsive to students' concerns. _____

5. Student–student interaction

13. Most students participate more than required in Discussion Forums. _____
14. Other students' posts to the Discussion Forum are helpful in understanding different viewpoints. _____
15. Other students' posts are not useful in learning course content. _____

6. Mentoring support

16. More often than not I felt intimidated asking my online professor questions. _____
17. I don't feel comfortable asking my online professors for advice. _____
18. Technology problems interfere with my online learning. _____

OUTCOMES

Learning

I am learning a lot in my online MBA program. _____

Satisfaction

I am very satisfied with the online courses in my MBA program. _____

Overall, I am disappointed with my online MBA program. _____

Quality

My online courses are of high quality. _____

Reprinted with permission, Taylor & Francis; Sebastianelli, R., Swift, C., and Tamimi, N. (2015). Factors affecting perceived learning, satisfaction, and quality in the online MBA: A structural equation modeling approach. *Journal of Education for Business, 90,* 296–305.

NATIONAL SURVEY OF STUDENT ENGAGEMENT (NSSE)

Sources: Chen, P. D., Guidry, K. R., and Lambert, A. D. (2009). Engaging online learners: A quantitative study of postsecondary student engagement in the online learning environment. In *Annual Meeting of the American Educational Research Association, San Diego, CA*. National Center for Postsecondary Research (2017). NSSE. http://nsse.indiana.edu/ (retrieved October 20, 2017).

Purpose: The NSSE was designed to assess quality of education and services at postsecondary institutions. The questions related to online learning were added in 2008.

Description: The NSSE includes 13 questions intended to assess online experiences at postsecondary institutions, ten of which are answered on a four-point Likert scale. Items are preceded by the stem, "In your experience at your institution during the current school year, about how often have you done each of the following?" Examples of items include "Discussed or completed an assignment using a 'synchronous' tool . . ." and "Used the Internet to discuss with an instructor topics you would not feel comfortable discussing face-to-face or in a classroom" (p. 21).

Development and validation: A set of 13 "experimental" items were developed by NSSE researchers to gauge student engagement in online learning. These items were deployed along with the original NSSE in a web-based survey to students at 45 institutions. A total of 22,000 freshmen and seniors completed the survey.

Full text access: The items related to online experiences are in the appendix of the source.

Note: Although this is a commercial item, other information about this survey may be found here: http://nsse.indiana.edu/html/survey_instruments.cfm (retrieved October 20, 2017).

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ONLINE FACULTY SATISFACTION SURVEY (OFSS)

Source: Bolliger, D. U. and Wasilik, O. (2009). Factors influencing faculty satisfaction with online teaching and learning in higher education. *Distance Education*, *30*(1), 103–116.

Purpose: The OFSS was developed to determine the extent to which faculty are satisfied with the quality and effectiveness of online courses. Faculty satisfaction has been deemed one of the five pillars of quality as described by the Sloan Consortium (2002).

Description: The OFSS includes 36 questions, 28 of which are rated on a four-point Likert scale from strongly agree (1) to strongly disagree (4). The scale represents three factors: student-related, instructor-related, and institution-related.

Development and validation: The OFSS was developed based on a review of research related to the subscales of student-related issues, instructor-related issues, and institutional-related issues. Items developed for the OFSS were compared with those on other similar scales that related to satisfaction with distance education. To assess face validity the measure was administered to 25 students, resulting in minor revisions. The survey was then administered to 122 participants, faculty who taught online courses, of whom 102 completed the survey. Factor analysis using orthogonal rotation was performed on the data. Nine dimensions were initially revealed; however, analysis of the scree plot demonstrated three discrete factors. The three-factor model explained 40.29 percent of variance. Loadings ranged from 0.35 to 0.78. CA values were calculated for each subscale, which ranged from 0.55 to 0.86. The student-related subscale had the highest CA. The entire scale had a CA of 0.85.

Full text: Full text of the instrument appears within tables in the text of the source.

*

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CHAPTER 2

Student Readiness to Learn Online and Self-Efficacy

There are many instruments that measure different types of student readiness to learn in an online environment. Some focus on student comfort and facility with technology, computers, and the internet, while others investigate student characteristics that would promote online learning success. Other readiness measures target particular populations of students. Student readiness also encompasses self-efficacy and its contribution toward success in online coursework. Although many institutions develop and administer their own readiness surveys before allowing students to enroll in online courses, Wladis and Samules (2016) caution that using readiness surveys may discourage students who are not at risk for poor outcomes from participating in distance education, rather than contribute to retention.

*

E-LEARNING READINESS SURVEY

Source: Wladis, C. and Samuels, J. (2016). Do online readiness surveys do what they claim? Validity, reliability, and subsequent student enrollment decisions. *Computers & Education, 98*, 39–56.

Purpose: The authors developed a survey similar to ones deployed to students at many institutions in order to determine whether these surveys predict outcomes.

Description: The survey includes 12 questions rated on a four-point Likert scale. Examples of items include "I have experience creating documents using Microsoft Word . . .", and "As a reader, I would consider myself . . ." (p. 55).

Development and validation: The authors reviewed and based their survey on 17 instruments that purport to measure online learning readiness. Many of the instruments they reviewed appear in this chapter. More than 24,000 students (all students) at an urban community college took the survey as prerequisite to enrolling in online courses. Students are allowed to register for courses whether or not they do well on the survey. To assess predictive validity, students who completed the course with a C– or higher were considered successful.

PCA with varimax rotation revealed a four-factor solution in which each factor had an eigenvalue greater than one. An eight-factor solution, however, explained 82 percent of the variance in scores. PCAs for both models were run. For each factor of the eight-factor model, one to two items loaded at or above 0.75.

Convergent and discriminant validity was demonstrated by the fact that the items that loaded on the same factor represented similar concepts, and each concept/factor appeared to be distinct from the others. Predictive validity was investigated through a regression. Successful course completion was predicted by factors 3 (reading and writing skills), 4 (time management), and 5 (GPA/academic preparation). Internal consistency reliability for the full scale was Guttman's Fourth Lambda of 0.81.

Per their results, no one variable in the readiness survey was correlated with enrollment by the student in future online courses. Further, institutional research data collection of student characteristics was a far better predictor of online learning success as compared to F2F.

Full text access: Full text of the survey appears in the appendix of the source.

*

MANAGEMENT EDUCATION BY INTERNET READINESS (MEBIR) SCALE

Sources: Parnell, J. and Carraher, S. (2003). The Management Education by Internet Readiness (MEBIR) Scale: Developing a scale to assess personal readiness for internet-mediated management education. *Journal of Management Education, 27*(4), 431–446.

Parnell, J. and Carraher, S. (2005). Validating the Management Education by Internet Readiness (MEBIR) Scale with samples of American, Chinese, and Mexican students. *Journal of Business Education*, *81*(1) 47–54.

Purpose: Business schools have been increasingly offering their programs online. Accordingly, it is essential to student success to ensure that students are prepared for a distance learning format.

Description: The MEBIR scale includes 12 items on a five-point Likert scale from strongly disagree to strongly agree. Subscales include technological mastery, flexibility of course delivery, anticipated quality of course, and self-management orientation.

Development and validation: The development of the MEBIR scale began with a literature review to help define what internet readiness in management education comprises. The three dimensions investigated included technological mastery (computers and the internet in particular), course flexibility (the degree to which the learner perceives the online course to be facilitated by "self-direction"), and quality (the perception of quality for the online course over the F2F course). The items for technological mastery were adapted from the Computer Attitudes Scale (Loyd & Gressard, 1984). From this review a list of 55 items was generated. The initial version was given to 133 graduate business students and two faculty members to determine both construct and content validity. These procedures resulted in 27 items being removed as they were vague, poorly worded, or irrelevant. The remaining 23-item survey was then evaluated through Exploratory Factor Analysis (EFA). The EFA revealed a three-factor model that accounted for 54.60 percent of the variance. Six items were removed as they did not load on one of the factors. Four items were removed because they did not theoretically load on the correct factor.

These remaining 15 items with an additional three that represented student self-management were deployed to 126 undergraduate students. PCA on this scale resulted in three factors that accounted for 66.80 percent

of the variance, although four items were removed. Loadings for all three factors were at or above 0.70. The final 12-item version was deployed to 185 undergraduate students.

Convergent and discriminant validity were assessed through analyzing a correlation matrix; items from within each subscale were moderately correlated, assuring convergent validity, while items from different subscales had low correlations with each other, indicating that the scale had discriminant validity. CAs of the subscales ranged from 0.697 to 0.855.

Full text access: Full text of the MEBIR scale appears in Table 1 of Parnell and Carraher (2003).

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TERTIARY STUDENTS' READINESS FOR ONLINE LEARNING (TSROL)

Sources: Pillay, H., Irving, K., and McCrindle, A. (2006). Developing a diagnostic tool for assessing tertiary students' readiness for online learning. *International Journal of Learning Technology, 2*(1), 92–104.

Pillay, H. Irving, K., and Tones, M. (2007). Validation of the diagnostic tool for assessing tertiary students' readiness for online learning. *Higher Education Research and Development, 26*(2), 217–234.

Purpose: The TSROL assesses students' readiness to learn in online courses in postsecondary institutions with respect to technical and computer skills and learner preferences.

Description: The TSROL is a 20-item diagnostic instrument representing four subscales: technical skills, computer self-efficacy, learner preferences, and attitudes toward computers.

Development and validation: In reviewing the literature the authors found several informal and research-based inventories from which the TSROL was derived. These scales include the OLRSAI (Watkins et al., 2004), the ROLQ (McVay, 2001; Smith, 2005), risk of non-completion surveys developed by Muse (2003) and Osborn (2001), and the ESPRI (Roblyer & Marshall, 2002). EFA and CFA procedures were described in Pillay et al. (2006). EFA was conducted on the initial 65-item version of the scale. All items that loaded at lower than 0.40 were removed. Items that loaded at greater than 0.40 on two or more factors were removed. This resulted in the final 20-item scale on four factors.

Further confirmatory analyses, as described in Pillay et al. (2007) were based on data derived from 254 students. KMO was determined to be an acceptable value of 0.89 and Bartlett's test was significant, indicating that the data were appropriate for factor analysis. Eighteen of the 20 items loaded at or above 0.40. CA values demonstrated good reliability on all scales from 0.78 to 0.92, except for learner preferences which was 0.55. The learner preferences subscale was revised to address these reliability issues.

Full text: Items from the scale are listed in Table 2 of the source.

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ONLINE LEARNING READINESS SURVEY (OLRS)

Source: Dray, B. J., Lowenthal, P. R., Miszkiewicz, M. J., Ruiz-Primo, M. A., and Marczynski, K. (2011). Developing an instrument to assess student readiness for online learning: A validation study. *Distance Education*, *32*(1), 29–47. http://doi.org/10.1080/01587919.2011.565496 (retrieved October 20, 2017).

Purpose: Given the consistent rise in student participation in online courses over the last decade, assessment of user readiness to participate in such classes is necessary. Previously published readiness surveys tended to focus on students' facility with technology, access to technology, and student perceptions of their learner preferences and self-efficacy. According to Dray et al. the OLRS expands on these constructs and is supported by a more rigorous method of development and validation.

Description: The OLRS includes eight demographic items and two subscales – learner characteristics (15 items) and ICT (17 items) – but has since been revised. Learner characteristic items include statements such as "I am confident in my ability to excel in a college program," and "I give constructive and proactive feedback to others even when I disagree" (p. 37). The technology subscale asked about students' experiences with using different types of technology. See below for full text access.

Development and validation: The OLRS was developed using a three-phase approach focusing on translation validity and criterion-referenced validity. The initial version of the scale was developed based on a review of the literature on student readiness. Faculty from education, health sciences, and academic computing comprised an expert panel who reviewed the scale in order to establish face and content validity. To more rigorously address content and face validity, the authors employed cognitive testing through focus groups and interviews of 26 graduate students that were conducted entirely online. Cognitive testing included the task of asking respondents "to say in their own words what they think the question is asking," and to describe why they chose an answer (p. 33). The participants were also interviewed to determine how well they understood the questions and any related issues. More specifically, during this phase of the development, each participant was asked to respond to the following three questions for each item on the survey: "(1) What did the whole question mean to you? (2) Would you reword the

question? How? (3) When you created your response, what was it that you had in mind?" (p. 36). The researchers then coded and analyzed the responses to determine whether student responses matched what the authors intended the question to mean. The authors found that students were responding to questions based on their own life experiences rather than with the online learning environment in mind. Therefore, the authors added a prompt directing students to answer the questions in the context of their online courses.

From these procedures, a 32-item scale was designed that measured learner characteristics and the technological abilities of students. Additional similar items from three other readiness surveys (Bernard et al., 2004; Mattice & Dixon, 1999; McVay, 2001) were added in order to test for criterion-referenced validity. A total of 96 items comprised this version of the scale to be used for the validation portion of the study. The survey was deployed to 501 students in online graduate and undergraduate courses.

Confirmatory factor analysis (CFA) was employed to validate the structure of the survey. A five-factor model was derived from the data. The CFE, RMSEA, and chi-square/df improved in the five-factor model as opposed to the two-factor model. The additional surveys were included with this administration of the OLRS. The internal consistencies of these scales demonstrated with reasonable reliability. The items from the other scales were mapped onto the five factors derived from the CFA and demonstrated positive, significant correlations ranging from 0.31 to 0.43, thereby establishing convergent validity. The learner characteristics subscale yielded strong validity. Based on these results the technology capability scale was revised and renamed the ICT engagement subscale. The internal consistency of the scale was a CA of 0.78.

Full text access: Contact the authors at Barbara.Dray@ucdenver.edu for the full text.

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ONLINE LEARNING READINESS SCALE (OLRS)

Source: Hung, M.-L., Chou, C., Chen, C.-H., and Own, Z.-Y. (2010). Learner readiness for online learning: Scale development and student perceptions. *Computers & Education*, *55*(3), 1,080–1,090.

Purpose: The OLRS may be used to determine predictors of student success in online courses by determining their readiness to learn online with respect to learner control and technical skills in addition to the other commonly assessed characteristics such as management of learning and comfort with distance learning.

Description: The OLRS includes 18 items represented by five subscales that include computer and internet self-efficacy, self-directed learning, learner control (in an online context), motivation for learning in an online context, and online communication self-efficacy. Although the Likert scale range is not indicated in the full text of the scale available in the article, based on the wording of the statements they should be on a scale asking for level of agreement.

Development and validation: The construction of the instrument began with a literature review on the following topics: online communication self-efficacy, learner control, computer and internet self-efficacy, motivation for learning, and self-directed learning. Once the initial items were drafted, two college professors and two college students, all with distance education experience, were interviewed to determine whether any items or themes were omitted and to examine the statements for clarity. This process resulted in a 26-item scale, represented by the five dimensions listed above. The instrument was deployed to 1,051 students. In order to test the model, a CFA was conducted, resulting in the removal of eight items. Each variable or construct included three items. The final model demonstrated a significant chi-square = 451.18, indicating a bad fit. Other indices were evaluated to assess the model. Adjunct discrepancy-based fit index indicated an acceptable fit with a value of 3.61 (less than 5 is acceptable). Other values – RMSEA = 0.050, SRMR = 0.043, FGI = 0.95, and CFI = 0.99 – all indicated a good model fit.

The reliability coefficients for each subscale were acceptable and ranged from 0.727 to 0.867. The factor loadings from the CFA established convergent validity since all items loaded on each of the appropriate constructs to which they were assigned at or above 0.486. Discriminant

validity was established by calculating the root square of the average variance extracted for each subscale and comparing these values with the other subscales.

Full text access: Full text of the scale appears in the appendix of the source.

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STUDENT ONLINE LEARNING READINESS (SOLR)

Source: Yu, T. and Richardson, J. C. (2015). An exploratory factor analysis and reliability analysis of the Student Online Learning Readiness (SOLR) instrument. *Online Learning*, *19*(5), 120–141.

Purpose: This scale may be used to determine student competencies in three areas comprising student readiness to learning in distance education courses: social, communication, and technical competencies. The scale was also developed to examine Tinto's Student Integration Model utility in online courses. This scale differs from previously published online learning readiness scales in that others focus on computer, internet, or learning management system skills, whereas the SOLR emphasizes social and communicative, as well as technical aspects of distance learning.

Description: The SOLR includes 20 items on four subscales: social competencies with the instructor, social competencies with classmates, technical competencies, and communication competencies. All items are rated on a five-point Likert scale from disagree (1) to agree (5).

Development and validation: Following a review of the literature of student readiness to learn online, the authors investigated incorporating aspects of Tinto's (1975) Student Integration Model into the development of their scale, primarily interactions with instructors and peers. Because student integration is one of the most significant factors impacting retention, this model has implications for distance education as well. Based on a review of the literature, items measuring social, communication, and technical competencies were adapted from Shen et al. (2013), Dray et al. (2011), and McVay (2001). All scales upon which the SOLR was based demonstrated reasonable reliability in their original forms.

The original 22-item scale was deployed to 333 undergraduate students in online courses. An EFA was then conducted on the results to determine and confirm the underlying factor structure. Kaiser-Meyer-Olkin (KMO) and Bartlett's test were used to confirm that the data factor analysis (FA) was appropriate for the data set. KMO = 0.914, and Bartlett's test was significant, $x^2 = 4346$, indicating that the EFA could then be conducted. Two items were removed after performing the EFA. This resulted in a 20-item scale which explained 66.69 percent of the variance. The four-factor structure including the four subscales named above was confirmed. Social, communication, and technical competencies were all correlated

with each other. The reliability coefficients for each subscale ranged between CA = 0.823 and 0.882 indicating that the scale demonstrated high internal consistency reliability.

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ROLE OF THE ONLINE LEARNER

Source: Comer, D. R., Lenaghan, J. A., and Sengupta, K. (2015). Factors that affect students' capacity to fulfill the role of online learner. *Journal of Education for Business, 90*, 145–155.

Purpose: Although undergraduate students have lots of facility with technology, as they are digital natives, they often overestimate their ability to do well in online courses. The scale described in the source assesses student characteristics that contribute to positive learning experiences in an online course. Additionally, while online program offerings have expanded exponentially in the last decade, questions about their quality and efficacy remain. By examining student characteristics, an instructor can structure the class to facilitate student success.

Description: The surveys used in this study were a pre-survey and post-survey. The authors administered a 50-item survey to assess students' readiness to learn online. This scale measured students' perceptions of their ability to learn, while a post-course survey assessed students' perceptions of the course and their own learning. Pre-survey was a 50-item scale on a four-point Likert-type rating system, from 1 (strongly agree) to 4 (strongly disagree). The scales rely on self-report.

Development and validation: The scales were developed based on items in Fisher et al. (2001), Jackson and Helms (2008), Kizlik, (2005), and Robinson and Hullinger (2008).

The authors administered a 50-item survey to assess students' readiness to learn online. This scale measured students' perceptions of their ability to learn, while a post-course survey assessed students' perceptions of the course and their own learning. Two hundred and seventy-five students took the pre-course survey, 248 took the post-course survey.

Because the survey was self-report, the authors derived their sample from multiple sections from several courses over three years. Similar items were also separated in each administration of the survey to avoid biased responses from students due to "consistency motive and theory-in-use" biases (p. 148). Additionally, the authors analyzed the data with a single factor test in which only 17 percent of the variance was explained, while multiple factors explained far more of the variance. Therefore, the authors surmised that common method variance would not threaten the validity of the data.

Both scales were analyzed using principal component analysis with varimax rotation. For the pre-course scale, four subscales emerged: capability, self-discipline, active learning, and overall learning orientation. Loadings of items greater than 0.4 were retained. Discriminant validity was established because factors for which the values were less than 0.85 were considered distinct from other factors. The highest discriminant validity value was 0.687. After these procedures 40 items were retained. These factors explained 35 percent of the variance. CA for each factor ranged from 0.61 to 0.821. Low scores on the first three factors and high scores on the fourth factor indicates greater readiness for learning online. Student responses indicated that they believed themselves to be prepared for online learning.

The post-course survey also revealed four factors that accounted for 43 percent of the variance: students' perceptions of their overall learning, value of course discussions, course materials, and the course workload. All items retained for this scale loaded at greater than 0.40. CA values ranged from 0.532 to 0.836 for each factor. Low scores on the first three subscales indicate the student's positive perception of learning, while low scores on "course workload" indicate the perception that the course was demanding.

Full text: Full text of all items in the final version of the scales appear in tables within the source.

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STUDENT READINESS FOR COMPUTER-SUPPORTED COLLABORATIVE LEARNING (SR-CSCL)

Source: Xiong, Y., So, H.-J., and Toh, Y. (2015). Assessing learners' perceived readiness for Computer-Supported Collaborative Learning (CSCL): A study on initial development and validation. *Journal of Computing in Higher Education*, *27*(3), 215–239.

Purpose: The SR-CSCL is a readiness measure that is targeted at assessing student readiness to participate in collaborative learning experiences prior to enrollment in an online course or similar distance experience. Results gleaned from the use of this instrument can help instructors and course designers prepare students for online learning experiences.

Description: The SR-CSCL is a 39-item instrument measuring student readiness to participate in computer-mediated collaborative learning experiences. The instrument comprises three scales. Items were answered on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The item stem upon which items were answered was "The possible reason I would like to participate in collaborative learning is . . ." (p. 222).

Development and validation: The authors began their development of the instrument with a literature review on learner readiness in general and with specificity to distance education formats and collaborative learning. The instrument was developed based on a framework that consisted of: motivation for collaborative learning, prospective behaviors for collaborative learning, and online learning aptitude. Items were adapted from scales representing the three dimensions in the framework (Chow & Law, 2005; Schoor & Bannert, 2011; Xie et al., 2006). Motivations for collaborative learning included four subscales: interest, perceived value of collaborative learning, self-efficacy, and reinforcement. Reinforcement is extrinsic motivation, while the other three subscales fall under the category of intrinsic motivation.

The prospective behaviors for collaborative learning includes items adapted from Stevens and Campion (1994). The initial version of the scale included 27 items on four subscales: communication, conflict resolution, problem solving, and self-management. These subscales represent inter- and intrapersonal aspects of learning. The online learning aptitude scale covered both the perceived technical abilities of the student and the level

of comfort with online learning. Items for the online learning aptitude scale were adapted from Hung et al. (2010), Kerr et al. (2006), and Smith (2005).

After the items were generated, they were reviewed by a panel of experts to ensure content validity. The five experts were faculty members with expertise in online collaborative learning and instrument development and validation. Items were removed or revised based on feedback from the panel. The instrument was then translated into Chinese by one of the authors as the study was conducted in China. After review, 55 items remained on the pilot questionnaire.

The initial pilot version of the scale was sent to 300 students, of which 120 students responded. An item analysis was conducted first to determine which items should be removed based on whether the CA would improve with its deletion. Eight items were removed due to this analysis. Then the survey was sent again to 400 students, of which 295 responded, to validate the structure of the instrument. An EFA using PCA with oblique rotation was employed to determine whether the factor structure was supported. The KMO had a value above 0.60 and the Bartlett's test was significant – both results indicating the EFA was an appropriate analysis on these data. All items but three on the motivation for collaborative learning scale loaded at or above 0.476 and loaded onto the designated subscales. Those three items were deleted. Four factors accounted for 60.5 percent of the variance. The scale "prospective behaviors for collaborative learning" had five items that were deleted because they loaded on factors that deviated from the proposed structure. The four subscales accounted for 62.5 percent of the variance. The online learning aptitude scale included nine items that all loaded on their appropriate factors. These factors accounted for 63.7 percent of the variance. A CFA with a maximum likelihood estimation (MLE) was employed to determine model fit. Several indices of fit were assessed including comparative fit index, RMSEA, and standardized summary of the average covariance residuals (SRMR). The results of these analysis indicated that the data were within acceptable ranges thereby demonstrating a good fit for the model.

Full text access: Full text of the instrument is available in the appendix of the source.

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TEACHER READINESS FOR ONLINE LEARNING MEASURE (TROLM)

Source: Hung, M.-L. (2016). Teacher readiness for online learning: Scale development and teacher perceptions. *Computers & Education, 94,* 120–133.

Purpose: The TROLM may be used to assess the readiness of elementary and middle school teachers to participate in online learning. This utility of this instrument varies from other online learner readiness measures in that teachers are professionals who are fully developed learners with an undergraduate degree and perhaps a graduate degree. This measure may be used to assist online instructors in identifying the skills or competencies in which teachers are deficient so that they may be remedied prior to taking an online course.

Description: The TROLM includes 18 items measured on a five-point scale from strongly disagree (1) to strongly agree (5). The scale includes four factors: self-directed learning, institutional support, communication self-efficacy, and learning-transfer self-efficacy.

Development and validation: The development of the TROLM was based on a review of the literature on learner readiness, although Hung acknowledges the gap in research on elementary and middle school teachers. Primarily Hung focused on the literature on teachers as adult learners, the impact of institutional support on student persistence, communication self-efficacy in the context of online learning, and transfer of learning. Additionally, Hung focused on studies that used the OLRS she and colleagues developed in 2010.

An initial draft of the measure included 26 items. A focus group of 13 elementary and middle school teachers who had participated in online learning previously, and two professors who had taught online, was convened. The focus group reviewed the items and was asked to place them into groups, and name those groups. Items that were ambiguous or appeared to belong to more than one group were removed, resulting in an 18-item scale.

Two samples were used to conduct EFA and CFA to determine the underlying structure of the TROLM. The first sample included 128 elementary and MS teachers in an online education class. The second sample included 248 teachers of similar backgrounds. The KMO coefficient was

0.82, while Bartlett's test was significant, indicating the suitability of factor analysis on the data. The EFA with PCA and varimax rotation revealed a four-factor structure explaining 67.80 percent of the variance. All items loaded higher than 0.58 for all of their respective factors. Reliability analysis revealed a CA of 0.88.

A CFA was employed using the second sample of participants. Goodness of fit was assessed using chi-square, RMSEA, SRMR, NFI, and CFI. Results yielded a good fit that confirmed the four-factor, 18-item model. All standard estimates were significant and exceeded 0.50, indicating support for convergent validity. Discriminant validity was also established in that each factor was distinct from the others.

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MOBILE LEARNING READINESS (MLR)

Source: Lin, H., Lin, S., Yeh, C., and Wang, Y. (2016). Measuring mobile learning readiness: Scale development and validation. *Internet Research, 26*(1), 265–287.

Purpose: The MLR is intended to assess student readiness to adopt mobile learning systems, and particularly addresses learning self-efficacy with respect to mobile computing. Although mobile learning in both formal and informal settings can be effective, academic success may be mitigated by learner characteristics, particularly mobile computer anxiety.

Description: The MLR is a 55-item (initial version) scale representing three factors: m-learning (mobile learning) self-efficacy, motivation, and optimism. Four additional items make up overall mobile learning readiness and the intention to use a mobile learning system. All responses are scored on a seven-point Likert scale from strongly disagree (1) to strongly agree (7). Prior to beginning the survey, respondents are introduced to the term m-learning.

Development and validation: Items for the MLR were generated after the authors conducted a literature review on instruments that measured online learner readiness, technology readiness, and mobile computing anxiety (MCA). The authors adapted items for use in an m-learning context from the Technology Readiness Index (Parasuraman, 2000), the Readiness for Online Learning Scale (Smith et al., 2003), the OLR (Hung et al., 2010), and MCA (Wang, 2007). A panel comprising three experts in m-learning, five graduate students in information systems, and two m-learning users reviewed the initial version of the scale to evaluate the completeness and appropriateness of the items, thereby assuring content and face validity. Content validity was also supported through its development based on previously published scales during the literature review. The review by the panel resulted in the 55-item Likert-type scale.

To test the survey, the instrument was posted on BBS websites in Taiwan. A sample of 319 responses was derived from this method. A factor analysis was then performed to determine the factor structure of the scale. Based on ten iterations of the FA 36 items were excluded, resulting in a 19-item scale. Criterion/concurrent validity was determined by examining whether scores on the MLR scale correlated with the

criterion variables. The criterion variables in this study were represented by "two generic measures of readiness for m-learning . . ." (p. 275). Correlations were a value of CA = 0.839. Convergent validity was supported by the fact that all items loaded above 0.60 (most were above 0.70), except for two items, on their corresponding factors or dimensions. Discriminant validity was assured by calculating correlations of scores on each dimension with the others. Each factor was significantly discriminant. Nomological validity, a type of construct validity, indicates that the scale is predictive of similar constructs. Therefore, the responses to two items on the MLR that asked students' intention to use mobile learning systems were compared with scores on the MLR. Higher scores on the MLR predicted greater intention to use m-learning systems in the future. Pearson correlations was significant at a value of 0.725, thereby supporting nomological validity. After all validity testing was complete, the scale was normed in that the distribution of scores was evaluated to determine where a respondent's individual score placed them on the scale. Norms by percentile are reported on page 278 of the source; a synopsis of scores indicates that a score of 133 places an individual at the 100th percentile, while a score of 104 places them at the 50th percentile. The CA for the 19 items on the MLR was 0.938. The CAs for all three subscales were above 0.90.

Full text access: Full text of the initial 55-item scale appears in the appendix of the source.

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READINESS FOR ONLINE LEARNING QUESTIONNAIRE (ROLQ)

Sources: McVay, M. (2000). Developing a Web-based distance student orientation to enhance student success in an online bachelor's degree completion program. Unpublished practicum report presented to the Ed.D. Program, Nova Southeastern University, Florida.

McVay, M. (2001). *How to be a successful distance learning student: Learning on the Internet*. New York: Prentice Hall.

Smith, P. J. (2005). Learning preferences and readiness for online learning. *Educational Psychology*, *25*(1), 3–12.

Purpose: The ROLQ was designed to determine student ability to succeed in online learning.

Description: The ROLQ is a 13-item questionnaire in which students rate their level of agreement with each statement from 1 to 4. Examples of items include "I am comfortable communicating electronically," and "As a student, I enjoy working independently" (p. 9).

Development and validation: The ROLQ was developed by McVay (2000; 2001) and demonstrated validity through his studies, albeit with a relatively small sample of just over 100 participants. Smith (2005) administered the survey to 314 Australian students to confirm the instrument's factor structure. Prior to factor analysis, indices of factorability were conducted. KMO was a 0.78 and Bartlett's was significant, indicating that the data were appropriate for factor analysis. PCA with varimax rotation was conducted on the data. A two-factor model accounting for 42.2 percent of the variance was accepted over a three-factor solution representing 50 percent of the variance. The loading cutoff was 0.40, although the two factors that emerged were self-management of learning and comfort with e-learning. The Cronbach's Alpha of the scale demonstrated a reliability of 0.79.

Full text access: Full text of the items appears in Table 2 of Smith (2005).

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SELF-REGULATED ONLINE LEARNING QUESTIONNAIRE (SOL-Q)

Source: Jansen, R. S., van Leeuwen, A., Janssen, J., Kester, L., and Kalz, M. (2016). Validation of the self-regulated online learning questionnaire. *Journal of Computing in Higher Education*. https://doi.org/10.1007/s12528-016-9125-x (retrieved October 20, 2017).

Purpose: Increasingly, students are participating in Massive Open Online Courses (MOOCs), where these participants have more autonomy over their learning than in F2F or even traditional online courses. MOOCs are often free and open to anyone who wishes to participate. No prerequisites are necessary, and students anywhere who would not normally be able to access education at the postsecondary level may do so when participating in a MOOC. Because of their open access nature, direct interaction with instructors is rare. Often the only feedback is through automated messages or quizzes. Therefore, students must plan and monitor their own work and success. Accordingly, self-regulation, the active participation in one's own learning process, is the characteristic that drives success in this type of learning environment. The questionnaire developed by Jansen et al. seeks to measure self-regulation in online courses. The implications for the use of this measure extends to traditional online courses as well.

Description: The SOL-Q includes 36 items on five scales: metacognitive skills, environmental structuring, help seeking, time management, and persistence. Items are answered on a seven-point Likert scale from 1 "not true at all for me" to 7 "very true for me." Items are presented to participants in a randomized order.

Development and validation: A review of previously published instruments intended to measure self-regulation revealed the identification of several widely known metacognitive measures, including the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich et al., 1993) and the Metacognitive Awareness Inventory (MAI; Schraw & Dennison, 1994). However, these instruments only assessed self-regulation using task strategies. Additionally, none measured the cognitive processes of learners engaged in self-regulation as identified by Puustinen and Pulkkinen (2001): the preparatory, performance, and appraisal phases.

To develop the initial version of the questionnaire, the authors combined items from the measures identified through the literature review: MSLQ (Pintrich et al., 1993), OSLQ (Online Self-Regulated Learning Questionnaire; Barnard et al., 2009), MAI (Schraw & Dennison, 1994), and the LS (Learning Strategies questionnaire; Warr & Downing, 2000). The SRL includes 53 items over 11 subscales that are attributed to three phases of self-regulation. Preparatory phase: task definition, goal setting, and strategic planning; performance phase: environmental structuring, time management, task strategies, help seeking, comprehension monitoring, motivation control, and effort regulation; and the appraisal phase which includes the subscale strategy regulation. Items are answered on a seven-point Likert scale from 1 "not true at all for me" to 7 "very true for me." Each item was assigned to one of the three phases as described above, and one of the activities attributed to each phase. Redundant items were removed, and a clarifying statement of "in this online course" was added to each item. The final version of the questionnaire included 53 items within 11 subscales.

The questionnaire was deployed to participants in an eight-week MOOC, of which 154 students completed the survey. An EFA was then conducted on these data. Factors with an eigenvalue greater than 1, and that had also been identified through examination of scree plot helped to identify the number of factors within this scale. Parallel analysis, in which random data matrices are created, was also conducted. Principal axis factoring with oblique rotation was used to explore a five-factor structure. Items related to task strategies appeared in all the factors, indicating that they did not belong to a specific factor, and were therefore removed. The FA was repeated. Items loading below 0.32 were removed. Items that loaded onto two factors above this threshold were also removed if the difference between these loadings was less than 0.15. The model explained 46.58 percent of the variance. Reliability of items was between alpha = 0.68 and alpha = 0.91. This analysis resulted in the five factors described above. The model identified through FA differed from the theoretical model in that task strategies were removed, a metacognitive skills subscale was created, and a persistence subscale was developed.

A CFA was conducted on the new scale on 159 students participating in a MOOC. In this phase students could take either a Dutch or English version. Four models of the scale were explored: the original 53-item model; the 45-item model that did not include task strategies; the 36-item model, and a model that was based on a combination of the EFA and the theoretical model. Model fit statistics were computed using NC, RMSEA,

CFI, and AIC. Based on the results of these analyses, the exploratory model (SOL-Q) provided a better fit than the other models. Additionally, metacognitive skills form a single factor when measuring self-regulation.

Full text: Full text of the SOL-Q appears in the appendix of the source.

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ONLINE SELF-REGULATED LEARNING INVENTORY (OSRLI)

Source: Moon-Heum, Cho and Jonassen, D. (2009). Development of the human interaction dimension of the Self-Regulated Learning Questionnaire in asynchronous online learning environments. *Educational Psychology*, *29*(1), 117–138. https://doi.org/10.1080/01443410802516934 (retrieved October 20, 2017).

Purpose: Moon-Heum and Jonassen posit that when students in online courses interact with other humans, peers, and instructors, those external factors interact with their internal self-regulation factors, such as motivation and cognition to "produce unique online self-regulated learning" (p. 118). The OSRLI was developed to investigate how internal and external factors related to self-regulation work together. Previously, only traditional external factors such as exams, writing, and reading were included in self-regulation scales.

Description: The OSRLI includes items that are answered on a seven-point Likert scale. Different phrases were used for sets of questions such as "How confident are you that you could do the following tasks?" Other sets of questions related to self-efficacy were answered using the phrase "How true of you is the following statement?"

Development and validation: The development of the OSRLI was based on a literature review on self-regulation as well as scale development. Seventy-eight items were generated for the initial version of the scale, covering the categories of online human interaction, self-efficacy for online human interactions, concern for online human interactions, metacognitive strategies, and cognitive strategies for human interaction. The items were then reviewed by a panel of experts and potential participants to determine whether the items fit the constructs being measured, resulting in 24 items being removed. Next, two focus groups were organized comprising doctoral, masters, and one undergraduate student with experience in online courses. These students reviewed each item for clarity and validity, resulting in the removal of several items. The final version was then reviewed by an expert panel again. Then, this version was administered to 17 undergraduate students to check for the readability of the scale. Finally, the last version was piloted with six students who were asked to think aloud as to the meaning of each item on the scale – to check for clarity and comprehensiveness.

The finalized version of the scale was administered to 244 students from 64 online courses. Most participants were female graduate students. EFA was conducted on the data set resulting from this procedure. Because affect/motivation and metacognition/cognition are distinct constructs, the subscales were analyzed separately. The first EFA examined 33 items on the affect/motivation scale. Communalities ranged from 0.31 to 0.82. Five factors with eigenvalues greater than 1 were identified. The data were further analyzed, fitting models with 3, 4, and 5 factors. Additionally, analyses were conducted both with and without the four items that loaded lower than 0.40. Ultimately, the researchers determined the four-factor solution, removing the four items with low communalities, and an item that loaded less than 0.45, to be the strongest model. This model explained 63.73 percent of the variance. Reliability analyses revealed CA values for each item ranging from 0.68 to 0.92.

EFA was then conducted on the interaction strategies scale, which included 19 items. A principal-axis extraction analysis was performed revealing communalities between 0.18 and 0.62. The researchers determined that a three-factor solution including items with low loadings was most appropriate. This model explained 48.80 percent of the variance. Reliability analyses revealed CA values for each item ranging from 0.54 to 0.80.

An additional study was conducted to assure the factor structure. A total of 195 students participated, again mostly white, female graduate students who were in online courses. To assess model fit indices, the researchers calculated chi-square, chi-square divided by degree of freedom, CFI, Tucker and Lewis index (TLI), SRMR, and RMSEA. Overall, the data revealed a close model fit. Goodness of fit indicators were as follows: Chi square/df = 2.08, CFI = 0.94, TLI = 0.92, SRMR = 0.06, and RMSEA = 0.07.

To improve the model an LM test was employed to determine items that were correlated. Mixed results were revealed. The reliability of the affect/motivation subscale was 0.81 for the first sample, and 0.80 for the second. For the interaction strategies, the alphas were also 0.81 and 0.80 respectively.

Full text: Items are listed within tables in the full text of this source, and reprinted below.

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ONLINE SELF-REGULATED LEARNING INVENTORY

Affect/Motivation Scale

The following questions ask about your confidence in your current ability to successfully complete the following tasks while you are engaged in human interactions conducted in the online course. The interactions include discussion, group work, collaboration, asking questions to either the instructor or students, and so on. Interactions could occur with a variety of online tools such as an email, a discussion board, and an instant messenger

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Please rate each statement using the following scale:

1. Not confident at all
2. Little confident
3. A little confident
4. A fair amount confident
5. Much confident
6. Very much confident
7. Completely confident

Please check one number from the scale to rate your level of confidence in your current ability to successfully complete the following tasks in this online course.

Self-efficacy for Interactions with Instructors

Ask for help from the instructor whenever it is necessary. _____

Ask a question to the instructor. _____

Share my honest feelings with the instructor about the course. _____

Self-efficacy for Contributing to the Online Community

Contribute to the development of an online community. _____

Initiate a topic for discussion. _____

Post a relevant question. _____

The following questions ask about your feelings while you are engaged in the human interactions conducted in this online course. The interactions include discussion, group work, collaboration, asking questions to either the instructor or students, and so on. Interactions could occur with a variety of online tools such as an email, a discussion board, and an instant messenger.

Please rate the following statements as honestly as you can in this online course:

1. Completely untrue
2. Mostly untrue
3. Slightly untrue
4. Neutral
5. Slightly true
6. Mostly true
7. Completely true

Enjoyment of human interactions

I enjoy interacting online with other students in the course. ____

I enjoy reading other students' comments about my postings. ____

I enjoy sharing my knowledge in my online interactions in this course. ____

I enjoy providing help to other students via my online interactions. ____

I enjoy replying to other students' postings. ____

I enjoy sharing relevant personal experiences with students in this online course. ____

I enjoy seeing discussions develop due to my posting. ____

Concern for Interactions with Students

I am concerned about being misinterpreted by other students. ____

I am concerned that my posting might be disregarded by other students in this course. ____

I am concerned about being negatively judged by other students. ____

I am concerned about hurting other students' feelings in my online interactions. ____

Interaction Strategies Scale

The following questions ask about your human interaction strategies conducted in this online course. The interactions include discussion, group work, collaboration, asking questions to either the instructor or students, and so on. Interactions could occur with a variety of online tools such as an email, a discussion board, and an instant messenger.

Please rate the statements as to how almost always true of you or never true of you with each statement using the following scale:

1. Never true
2. Almost never true
3. Frequently not true
4. Sometimes true
5. Frequently true
6. Almost always true
7. Always true

Writing strategies

Before I post my message, I read it again to make sure the message correctly states what I want to say. ____

When I write an online message, I try to organize my thoughts as much as I can. ____

Before I post a message, I consider how to present my ideas clearly. ____

I check my spelling and grammar before posting. ____

Continued

Responding strategies

I respond to others' postings or emails in a timely manner. _____

I wait to post until just before I am required to do so. (Reverse) _____

When I see others' online requests for help, I try to help them. _____

I regularly check this online course to keep up to date on course activities. _____

Reflection strategies

I use others' postings to help organize my own thoughts about the course. _____

I check others' postings to evaluate my own comprehension of the material. _____

I rarely interact online with others to make sure I understand the course content. (Reverse) _____

Reprinted with permission, Moon-Heum, Cho and Jonassen, D. (2009). Development of the human interaction dimension of the Self-Regulated Learning Questionnaire in asynchronous online learning environments. *Educational Psychology*, *29*(1), 117–138.

ONLINE LEARNING SELF-EFFICACY AND LEARNING SATISFACTION

Source: Shen, D., Cho, M.-H., Tsai, C.-L., and Marra, R. (2013). Unpacking online learning experiences: Online learning self-efficacy and learning satisfaction. *Internet and Higher Education, 19,* 10–17.

Purpose: Two scales were developed for this study, one to measure the construct of online learning self-efficacy and the other to assess learning satisfaction, in order to examine the relationship between the two constructs.

Description: The online learning self-efficacy scale includes 35 items on five factors including SE to complete an online course, SE to interact socially with classmates, SE to handle tools in CMS, SE to interact with instructors, and SE to interact with classmates for academic purposes.

Respondents rate each item on a 11-point Likert scale from zero (cannot do at all) to 10 (highly confident can do). The learning satisfaction scale included five items on a scale of five from strongly disagree to strongly agree.

Development and validation: A review of the literature on online learning self-efficacy helped the authors to identify six different types of self-efficacy (SE): SE to complete an online course, SE to interact with classmates, SE to interact with an instructor, SE to self-regulate in online learning, SE to handle a CMS, and SE to socialize with classmates. This review resulted in a pool of 120 items that was examined by an expert panel comprising five doctoral students and two professors experienced in distance education and test development. Each expert reviewed and rated each item on a scale of 1–3 (not relevant at all to very relevant) to assign it to the dimension they thought was most relevant. After this review, 35 items were selected to represent the final version of the scale.

A total of 406 undergraduate and graduate online students participated in the study. An EFA with principal axis factor extraction with oblique rotation was used to determine the dimensions of the scale. KMO values were 0.947 and Bartlett's test was significant, indicating that the data were acceptable for FA. The EFA revealed five factors explaining 74.50 percent of the variance. Although loading cutoff was 0.40, all items loaded on their respective factors at or above 0.50. The five factors confirmed those identified in the literature review and were named as described in the

description of the scale above. CA values for all subscales were at or above 0.92.

The online learning satisfaction scale was adapted from Lin (2005) and demonstrated a CA of 0.88.

Full text: The full text of each item appears in Table 2, with factor loadings, of the source.

*

ONLINE LEARNING VALUE AND SELF-EFFICACY SCALE (OLVSES)

Source: Artino, A. R. and McCoach, D. B. (2008). Development and initial validation of the Online Learning Value and Self-Efficacy Scale. *Journal of Educational Computing Research, 38*(3), 279–303.

Purpose: Research on DL has proposed that self-regulation, task value, and self-efficacy play an essential role in student success in online learning. Toward that end the OLVSES assesses perceived task value and self-efficacy of students in a self-paced online course.

Description: The OLVSES is a self-report measure comprising 11 items on a two-factor scale: task value and self-efficacy. All items are rated on a seven-point Likert scale from completely disagree to completely agree.

Development and validation: The initial version of the OLVSES was developed based on a review of the literature on task value (Eccles & Wigfield, 1995; 2002) and self-efficacy for learning in the context of self-paced online learning (Bandura, 1977; 1986). The four constructs examined for this instrument included attainment value, intrinsic interest value, extrinsic utility value, and self-efficacy for learning self-paced, online training. Ten items for each construct were written based on the definitions derived from the literature review. The items were compared with those in published scales. Six experts then reviewed the initial pool of 41 items. The content experts were asked to identify the construct to which the item belonged, state their level of confidence that the item belonged in that category, indicate the relevance of that item to that category, and rate favorability for that item to its assigned construct. These procedures resulted in 13 items being dropped, and editing and rewording for clarity.

The revised draft of the scale was piloted with 204 members of the U.S. navy. EFA was conducted using principal axis factor (PAF) with oblique rotation on the 28 items. KMO was 0.93 and Bartlett's was significant, indicating that FA was appropriate. A three-factor model explaining 57.90 percent of the variance was derived from these analyses. Reliability analysis was then conducted. After redundancies were identified, several items were removed, resulting in a 16-item scale with a CA of 0.95 for task value, and a seven-item scale with a CA of 0.89 for self-efficacy.

Another study was conducted to confirm the factor structure. In this study 646 sophomores from the U.S. Naval Academy completed the survey. Most participants were men. The CFA revealed two latent variables found in the first study.

Goodness of fit statistics were calculated. The chi square/degrees of freedom ratio was greater than 2.0, the Tucer Lewis index (TLI) and CFI were less than 0.90. The RMSEA was greater than 0.80. These values indicate that data did not fit the model well. Problematic items were deleted and the CFA was conducted again. These procedures resulted in further removal of additional items. The goodness of fit statistics were re-computed and the values indicate that the data fit the model. Six items for task value and five items for the self-efficacy subscale were retained. All items loaded at 0.65 or higher on the appropriate factors. The CA for these two scales was 0.85 and 0.87 respectively.

Criterion-related validity was established in a third study that included 481 undergraduates from the U.S. Naval Academy. Items from the MSLQ (Pintrich et al., 1993) and subscales from the Achievement Emotions Questionnaire (AEQ: Pekrun, Goetz, & Perry, 2005) were deployed along with the OLVSES. Pearson Correlations revealed that task value and self-efficacy were related to each other at a value of 0.34, and were related to students' negative achievement emotions as well as metacognitive leaning strategies.

Full text: The full text of items appears within tables in the source.

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ONLINE TECHNOLOGIES SELF-EFFICACY SCALE (OTSES)

Source: Miltiadou, M., and Yu, C. H. (2000). Validation of the Online Technologies Self-Efficacy Scale (OTSES). https://eric.ed.gov/?id=ED445672 (retrieved October 20, 2017).

Lee, C.-Y. (2015). Changes in self-efficacy and task value in online learning. *Distance Education*, *36*(1), 59–79. https://doi.org/10.1080/01587919.2015.1019967 (retrieved October 20, 2017).

Purpose: The OTSES was one of the earliest self-efficacy scales developed specifically to address competencies related to distance education, including email, and other online communications.

Description: The OTSES includes 27 items on a four-point Likert scale from very confident to not confident at all when asked to answer the prompt "I would feel confident . . ." with respect to one of the items. Item statements were placed in four subscales: internet competency, synchronous interaction, and two subscales representing different aspects of asynchronous subscales. Examples of items included very basic internet-use skills such as "Logging on and off an email system" to more sophisticated abilities related to using an online course, such as "Responding to a message on an asynchronous conferencing system so that only one member can view it . . ." (pp. 6–7).

Development and validation: Development of the instrument began with a review of self-efficacy instruments. The authors discovered that online self-efficacy tended to be limited to computer skills, such as word processing and use of software and other programs. Construction of items began with a pool of 40 items written to match a list of objectives. A panel of students, experts in DL and self-efficacy, and survey designers then reviewed the list to make suggestions for changes, which resulted in the removal of ten items.

The instrument was then piloted with 330 college students taking online classes. After the responses were collected, factor analysis was performed to determine the latent constructs. Correlational analysis revealed that the four subscales were very highly related and therefore could be collapsed into a single construct or scale. Additionally, the FA indicated the removal of some items that did not load onto any of the subscales. A CA was computed for the whole scale at a value of 0.95. Although this scale was developed in 2000, Lee, as recently as 2015, confirmed its reliability.

Full text: Full text of the scale appears in the appendix of the source.

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CHAPTER 3

Evaluation of the Distance Education Teaching and Learning Environment

With the increase in research examining the efficacy of online teaching, student evaluation of distance education environments and online instructors has become a focus. Additionally, constructivist teaching has long been adopted as an efficacious method in F2F courses; however, constructivist methods are more difficult to implement in online courses. The measures discussed in this chapter follow two paths: the evaluation of online learning environments and evaluation of online constructivist learning environments.

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DISTANCE EDUCATION LEARNING ENVIRONMENT SURVEY (DELES)

Source: Walker, S. L. and Fraser, B. J. (2005). Development and validation of an instrument for assessing distance education learning environments in higher education: The Distance Education Learning Environments Survey (DELES). *Learning Environments Research, 8*, 289–308.

Purpose: The DELES may be used to identify social-psychological aspects of distance education learning environments, which differ from F2F classrooms.

Description: The DELES is a 34-item scale on six subscales, including instructor support, student interaction and collaboration, personal relevance, authentic learning, active learning, and student autonomy. Statements are rated on a Likert scale from always to never.

Development and validation: The instrument was developed through a three-step procedure which began with a literature review on the psycho-social aspects of learning environments. Through this literature review the authors located relevant learning environment measures that were related to three social organization constructs identified by the authors that included relationship, personal development, and system maintenance and change. The next stage of development concerned writing items to fit these factors and present them to an expert panel for review to assure face validity. After this review the authors also added an enjoyment of DE scale and an enjoyment scale which was modified from the Test of Science-Related Attitudes scale (Fraser, 1981), resulting in a 48-item scale. This draft of the scale was then piloted with over 600 students from undergraduates to doctoral students in distance education courses.

After the draft was piloted, FA was conducted on the data. PCA with varimax rotation was employed to determine the structure of the scales. Only those items with a factor loading above 0.50 were retained, leaving 34 items on the scale. The FA supported the six-factor structure for which the DELES was initially developed (see description). The entire scale accounted for 67.15 percent of the variance in scores. Reliability tests revealed a range of 0.75 to 0.94 for all six subscales. To assess whether there was a relationship between student enjoyment of DE and the

enjoyment subscale, correlation analyses were conducted. The results revealed small, positive, and significant correlation between the enjoyment scale and the DELES subscales, except for active learning.

Full text access: Full text of the scale appears in the appendix of the source.

*

ONLINE LEARNING CLIMATE SCALE (OLCS)

Source: Kaufmann, R., Sellnow, D. D., and Frisby, B. N. (2016). The development and validation of the online learning climate scale (OLCS). *Communication Education, 65*(3), 307–321.

Purpose: Little research has investigated the classroom climate in online courses. Classroom climate can be described as the perception by students of the relationship or rapport between the instructor and students, as well as the structure of the course. Classroom climate may be more difficult to assess in an online setting than in a traditional F2F class.

Description: The OLCS is a 15-item scale representing four factors: instructor behaviors, course structure, course clarity, and student connectedness. Each set of subscale items is preceded with a statement which asks the student to agree.

Development and validation: The development of the items on the OLCS was based on the Instructional Beliefs Model, which is based on the premise that communication is essential to the instructional setting (Weber, Martin, & Myers, 2011). Primarily, a student's academic self-efficacy is influenced by behaviors of the instructor, characteristics and behaviors of the student, and course structure. The Classroom Communications Connectedness Inventory (CCCI: Dwyer et al., 2004; Johnson, 2009) and the Classroom Climate Scale (CCS: Gokcora, 1989) were used as a basis for developing the initial construction of the OLCS. Instructor behavior items included communication outside of the classroom, immediacy behaviors, and engaging content or lectures. Student characteristic items focused on students' perceptions of other students, particularly with respect to collaboration and connectedness, based on Dwyer et al. (2004). Course structure issues focused on the course design, structure, and construction. How the structure supports course outcomes is a concern. Clarity and relevance were deemed an aspect of course structure in online course, whereas in F2F those two variables would be usually considered an instructor behavior.

After the 47-item scale was constructed, two focus group sessions were conducted with four experts. Each expert held a doctorate in education, communication, or library science and had experience conducting research in online pedagogy. Following these sessions, 15 items were removed, seven new items were added, and several were revised for clarity. The final

41-item scale was then presented to two new focus groups: one composed of students who had taken online classes, and one of faculty and staff who had taught or created online courses. The items were reviewed to ensure face validity and content alignment.

The final version of the scale was deployed to 235 undergraduate students who had taken at least one online class. Students also took the CCCI and CCS, both of which demonstrated reliability of CA = 0.95 and 0.77 respectively, for this study. The data were then analyzed using principal axis analysis with Promax rotation. The result of the KMO was 0.87 and Bartlett's test was significant, indicating that the data were appropriate for factor analysis. The first EFA revealed that 38 items loaded on multiple items or did not load on theoretically logical factors, and were deleted. Another EFA was conducted on the remaining 15 items, and resulted in four factors: instructor behaviors, course structure, student connectedness, and course clarity. These four factors accounted for 57.07 percent of the variance, with a CA of 0.90.

To establish convergent validity the scores on the OLCS were compared with the CCCI and CCS. The CCS was correlated with the OLCS at a rate of $r = 0.608$, $p = 0.000$. The CCCI was correlated with the OLCS at a value of $r = 0.538$, $p = 0.000$.

Full text: Items from the scale are listed within a table in the source.

*

STUDENT EVALUATION OF ONLINE TEACHING EFFECTIVENESS (SEOTE)

Source: Bangert, A. W. (2008). The development and validation of the Student Evaluation of Online Teaching Effectiveness. *Computers in the Schools*, *25*(1/2), 25–47. http://doi.org/10.1080/07380560802157717 (retrieved October 21, 2017).

Purpose: To assess teaching effectiveness in online contexts with a focus on constructivist-based practices to provide instructors with constructive feedback to improve teaching.

Description: The SEOTE includes 23 items intended to assess "constructivist-compatible online teaching." Students respond to items on a six-point Likert scale from strongly agree to strongly disagree. Students are also asked to answer an open-ended question about the quality of online teaching. The scale includes four factors: student–teacher interaction, diverse talents and ways of learning, active learning, and cooperation among students.

Development and validation: The items for the SEOTE were written based on the Seven Principles of Effective Teaching (Chickering & Gamson, 1987). These principles are student–faculty contact, cooperation among students, active learning, prompt feedback, time on task, high expectations, and respect for diverse talents and ways of learning. The initial 35-item instrument was piloted with 24 online graduate students. Results revealed a CA of 0.94. Content validity was established by an expert panel of professors who teach online. Content was reviewed for clarity, accuracy, and to assess whether the questions reflected research-based practices for effective online teaching.

The next round of testing included 498 undergraduate and graduate students in online and hybrid courses. Twenty-six of the 35 items were selected for EFA as being most representative of the seven principles. The EFA resulted in a four-factor model, with a loading cutoff 0.40, and a final instrument with 23 items.

A second validation study with 807 students was then conducted. EFA was conducted on a randomly selected subsample of 404 students. The EFA resulted in four-factor model somewhat different from that of the previous testing. A CFA was then conducted with the second subsample of 403 students. The four-factor model was found to be an excellent fit

to the data as the comparative fit index (CFI) and nonnormed fit index (NNFI) demonstrated values greater than 0.90, which is indicative of a good model fit. A RMSEA (root mean square error of approximation) resulted in 0.042, also indicating that the model was a good fit

The results of the final rounds of testing revealed that the KMO yielded a result of 0.95 and the results of Bartlett's Test of Sphericity indicated that the data were appropriate for the factor analysis. The CA for each factor ranged from 0.94 to 0.82 in the exploratory phase and the confirmatory phase.

Full text: Full text of the SEOTE appears below.

*

SEOTE

1. My questions about course assignments were responded to promptly. ____
2. The amount of contact with the instructor was satisfactory. ____
3. I was provided with supportive feedback related to course assignments. ____
4. The instructor was accessible to me outside of this online course. ____
5. The instructor communicated effectively. ____
6. The instructor was respectful of students' ideas and views. ____
7. I felt comfortable interacting with the instructor and other students. ____
8. The instructor was enthusiastic about online learning. ____
9. My questions about WebCT were responded to promptly. ____
10. This course used examples that clearly communicated expectations for completing course assignments. ____
11. The course was structured so that I could discuss assignments with other students. ____
12. The course was used to stimulate thoughtful discussions. ____
13. This course included activities and assignments that provided students with opportunities to interact with one another. ____
14. This course included interactive assignments and links to examples from the Web that directly involved me in the learning process. ____

Continued

15. This course used realistic assignments and problem-solving activities that were interesting and motivated me to do my best work. _____
16. This course used realistic assignments and problem-solving activities related to situations that I am likely to encounter outside of this course or in a future job situation. _____
17. This course provided good examples and links to other examples published on the Web that helped to explain concepts and skills. _____
18. The course was structured to be user friendly. _____
19. The course was designed to provide an efficient learning environment. _____
20. The course allowed me to complete assignments across a variety of learning environments. _____
21. The course was designed so that technology would minimally interfere with learning. _____
22. This course allowed me to take responsibility for my own learning. _____
23. The assignments for this course were of appropriate difficulty level. _____

Reprinted with permission, Bangert, A. W. (2008). The development and validation of the Student Evaluation of Online Teaching Effectiveness. *Computers in the Schools*, *25*(1/2), 25–47.

PERCEPTIONS OF COURSE MANAGEMENT SYSTEMS

Source: Ioannou, A. and Hannafin, R. (2008). Deficiencies of course management systems: Do students care? *The Quarterly Review of Distance Education, 9*(4), 415–425.

Purpose: The purpose of this scale is to assess user perceptions of course management systems (CMS) and whether deficiencies, limitations, or particular functions impact those perceptions.

Description: The scale includes 11 items measured on a five-point Likert scale in addition to general questions about use of CMS. Examples of items include, "My overall experience with the course was improved," "My anxiety was reduced because I knew where to find class material," and "It saved me time." The structure of some questions asked users to report which features would be useful to have (2008, p. 61). Therefore, some items were attitudinal and others were not.

Development and validation: The items for the scale emanated from interviews with an online course instructor as well as a literature review on CMS functionality. Two experts in online learning were asked to review the instrument. The survey was given to 234 students in a F2F course where a CMS was used as a supplementary learning tool. Principal Axis Factor (PAF) was used to analyze the 19 items. Five factors explaining 59 percent of the variance were extracted. The five factors that emerged were user satisfaction, corrective feedback, personalized environment, response time, and ease of use. CAs for the subscales ranged from 0.45 (ease of use) to 0.79 (user satisfaction). Although the scale demonstrated moderate reliability, the structure of the instrument may have contributed to the psychometric characteristics because some items were attitudinal, while others asked participants to rate their preference for various functionalities.

Full text access: Full text of the scale appears in the appendix of the source.

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BLACKBOARD COURSE MANAGEMENT SUCCESS

Source: Tella, A. (2011). Reliability and factor analysis of a blackboard course management system success: A scale development and validation in an educational context. *Journal of Information Technology Education*, *10*, 55–80.

Purpose: Course management systems (CMS) play an important role in managing online teaching and learning. Blackboard is one of the most commonly used CMSs. Accordingly, the instrument described in the source seeks to assess factors of user success in using this CMS whether in an educational or corporate setting. The development of the instrument also describes the operationalization of CMS success. The scale can also be used by instructors to evaluate the CMS that they use.

Description: The Blackboard Course Management System Success scale includes 39 items on eight factors, which include criterion measure, system quality, content quality, service quality, teaching and learning quality, self-regulated learning, intention to use/usage, user satisfaction and net benefits. Items were answered on a four-point Likert scale ranging from strongly disagree to strongly agree.

Development and validation: The theoretical framework upon which the instrument was built includes that of information system success, which revealed variables derived from Delone and Mclean (1992; 2003). Additionally, evaluation of information systems, and teaching and learning quality, as well as the interactions between these variables were also investigated. In this study, success was defined as the degree to which the evaluator believed the CMS supported the objectives of the user. These variables include content quality, support service quality, teaching and learning quality, student self-regulated learning, user satisfaction, and net benefits of blackboard CMS.

The initial version of the scale included 52 items generated from the review of the literature on the variables mentioned above. A full list of sources consulted is on page 60 of the source. Surveys and interviews were then conducted to assure that no important variables were left out. Interviewees were asked to review the list of items, and 13 items were eliminated as a result of this review. Additional items were also suggested, resulting in a 39-item scale which includes an additional four criterion items asking for overall perceptions of impact or performance of the CMS.

The scale was deployed to instructors of one course in each department at the University of Botswana's graduate school. A total of 503 students participated in the study. Analyses were conducted on the 35 items (the four criterion items were removed).

Reliability tests were first conducted to determine whether any items should be deleted. FA was then conducted, and all items loaded on the appropriate dimension to which they were assigned at or above a loading of 0.60. Most items loaded above 0.80; however. The eight-factor model explained 75 percent of the variance in scores. The CA of the entire scale was 0.91, with CA values of each subscale ranging from 0.50 to 0.74. Criterion validity was assured by correlating the total score on the instrument with the sum of the four criterion items. The questionnaire demonstrated a criterion related validity of 0.70, indicating a strong relationship between the items on the scale and the criterion items. Convergent and discriminant validity was assessed by correlating scores of each subscale against the other subscales. The results showed that modest correlations, ranging from 0.37 to 0.62, demonstrate that the factors are associated with CMS success as well as each other.

The source also includes a scoring key that allows educators to evaluate their course.

Full text: The original 52-item scale appears in the appendix of the source. The tables on pages 65–66 of the source should be examined to determine which items are represented in the final version.

*

COMMUNITY OF INQUIRY (CoI) SURVEY

Sources: Arbaugh, J. B., Cleveland-Innes, M., Diaz, S. R., Garrison, D. R., Ice, P., Richardson, J. C., and Swan, K. P. (2008). Developing a Community of Inquiry Instrument: Testing a measure of the Community of Inquiry framework using a multi-institutional sample. *Internet and Higher Education*, *11*(3–4), 133–136.

Arbaugh, J. B. (2007). An empirical verification of the Community of Inquiry framework. *Journal of Asynchronous Learning Networks*, *11*(1), 73–85.

Purpose: Arbaugh et al. (2007, 2008) developed a measure that operationalized Garrison et al.'s (2000) Community of Inquiry (CoI) framework for creating effective learning environments, which focuses on social and cognitive presence. Previously, studies using the CoI framework evaluated narrative transcripts as the method of research.

Description: The CoI framework employs a collaborative–constructivist perspective of online learning experience facilitated by dialogue and reflection. The CoI survey is a 34-item measure on a four-point Likert scale from strongly disagree (0) to strongly agree (4). The instrument is comprised of three subscales: social presence (SP), teaching presence (TP), and cognitive presence (CP).

Development and validation: The CoI framework has been widely used in many studies. The survey was developed based on Garrison et al.'s (2000) research into collaborative and constructivist perspectives in online learning. The CoI framework focuses on the social presence aspect of learning. After the 34-item survey was developed using this framework, its psychometric validity was investigated through several studies. This entry focuses on what is reported in Arbaugh et al. (2008). The survey was deployed to 287 students at four institutions throughout the U.S. and Canada. Principal components analysis (PCA) was used to confirm the three-factor structure. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.96 for the entire scale, indicating that factor analysis should produce reliable and discrete factors. The three factors explained 61.3 percent of the variance; 51 percent of the variance is attributed to the first factor which is TP. The CA yielded values of 0.94 (TP), 0.91 (SP), and 0.95 (CP).

Full text: Full text of the CoI survey appears below.

*

Community of Inquiry Survey Instrument

(draft v14)

TEACHING PRESENCE

Design & Organization

1. The instructor clearly communicated important course topics. _____
2. The instructor clearly communicated important course goals. _____
3. The instructor provided clear instructions on how to participate in course learning activities. _____
4. The instructor clearly communicated important due dates/time frames for learning activities. _____

Facilitation

5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn. _____
6. The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking. _____
7. The instructor helped to keep course participants engaged and participating in productive dialogue. _____
8. The instructor helped keep the course participants on task in a way that helped me to learn. _____
9. The instructor encouraged course participants to explore new concepts in this course. _____
10. Instructor actions reinforced the development of a sense of community among course participants. _____

Direct Instruction

11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn. _____
12. The instructor provided feedback that helped me understand my strengths and weaknesses. _____
13. The instructor provided feedback in a timely fashion. _____

SOCIAL PRESENCE

Affective expression

14. Getting to know other course participants gave me a sense of belonging in the course. _____
15. I was able to form distinct impressions of some course participants. _____
16. Online or web-based communication is an excellent medium for social interaction. _____

Continued

Open communication

17. I felt comfortable conversing through the online medium. _____
18. I felt comfortable participating in the course discussions. _____
19. I felt comfortable interacting with other course participants. _____

Group cohesion

20. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust. _____
21. I felt that my point of view was acknowledged by other course participants. _____
22. Online discussions help me to develop a sense of collaboration. _____

COGNITIVE PRESENCE

Triggering event

23. Problems posed increased my interest in course issues. _____
24. Course activities piqued my curiosity. _____
25. I felt motivated to explore content related questions. _____

Exploration

26. I utilized a variety of information sources to explore problems posed in this course. _____
27. Brainstorming and finding relevant information helped me resolve content related questions. _____
28. Online discussions were valuable in helping me appreciate different perspectives. _____

Integration

29. Combining new information helped me answer questions raised in course activities. _____
30. Learning activities helped me construct explanations/solutions. _____
31. Reflection on course content and discussions helped me understand fundamental concepts in this class. _____

Resolution

32. I can describe ways to test and apply the knowledge created in this course. _____
33. I have developed solutions to course problems that can be applied in practice. _____
34. I can apply the knowledge created in this course to my work or other non-class related activities. _____

Five-point Likert-type scale

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

Reprinted with permission, Garrison, Full Text available here as well: https://coi.athabascau.ca/coi-model/coi-survey/ (retrieved October 22, 2017).

CONSTRUCTIVIST ON-LINE LEARNING ENVIRONMENT SURVEY (COLLES)

Sources: Taylor, P. and Maor, D. (2000). Assessing the efficacy of online teaching with the Constructivist On-Line Learning Environment Survey. Teaching and Learning Forum 2000

Yeo, S., Taylor, P., and Kulski, M. (2006). Internationalising a learning environment instrument for evaluating transnational online university courses. *Learning Environments Research, 9*, 179–194.

Purpose: The COLLES was developed to enable instructors to examine students' preferences for online learning environments and compare them with each student's actual learning experience. The survey was developed in response to Taylor and Maor's experiences of teaching professional math and science teachers who were preparing to engage in online instruction themselves. Because constructivist methods are often considered the most effective means of teaching math and science, the authors developed the questionnaire to comport with social constructivism in the online context as well.

Description: The COLLES is comprised of 24 items on six scales, including: relevance, reflection, interactivity, tutor support, peer support, and interpretation.

Development and validation: The original COLLES demonstrated interpretive validity per Maor and Taylor (2000). Yeo et al (2006) adapted the COLLES to use with transnational populations. They assessed validity by comparing mean scores of each subscale with other variables including open-ended survey questions and interviews. Reliability of the internationalized scales ranged from CAs of 0.85 to 0.91.

Full text: Full text of items for both versions appear in the tables of Yeo et al. (2006).

*

CONSTRUCTIVIST MULTIMEDIA LEARNING ENVIRONMENT SURVEY (CMLES)

Source: Maor, D. and Fraser, B. J. (2005). An online questionnaire for evaluating students' and teachers' perceptions of constructivist multimedia learning environments. *Research in Science Education, 35*, 221–244.

Purpose: The CMLES was developed to assess the extent to which learners in online courses perceive the learning environment to comport with constructivist methods of teaching. Constructivism purports to advance students' investigative skills. This scale focuses on students and teachers in high school science classes, but implications for postsecondary science courses are present.

Description: The CMLES asks students to respond to questions that ask their opinion of what is "wanted" in the online course in which they are in "right now." There are 30 items for which the respondent rates how often they do a stated task "in this class" on a scale of 1 (almost never) to 5 (always). The instrument includes six subscales: learning to communicate, learning to investigate, learning to think, relevance, ease of use, and challenge. Items in each subscale are preceded by the phrase "in this class." Examples of items include "I get the chance to talk to other students," "I carry out investigations to test my own ideas," "I get to think deeply about how I learn" (p. 243). The last three subscales ask the respondent to rate how many times they experience one of the statements in the classroom on a scale of 1 to 5.

Development and validation: The CMLES was based on the following scales: Student Negotiation, which is based on the Constructivist Learning Environment Survey (Taylor, Fraser, & Fisher, 1997), and the Computer Classroom Environment Inventory (Maor & Fraser, 1996). The original version of the scale included 30 items, five for each of the six subscales.

The survey was administered to 221 students in 10th and 11th grade and their teachers. PCA with varimax rotation was conducted on the data. All items except four loaded at or above 0.40. A five-factor model, excluding several of the items that loaded below the threshold represented 62.21 percent of the variance in scores. Subscales demonstrated CAs of 0.73 to 0.82.

Full text: Full text of the instrument appears in the appendix of the source.

*

E-LEARNING SYSTEMS SUCCESS (ELSS)

Source: Wang, Y.-S., Wang, H.-Y., and Shee, D. Y. (2007). Measuring e-learning systems success in an organizational context: Scale development and validation. *Computers in Human Behavior*, *23*(4), 1792–1808. https://doi.org/10.1016/j.chb.2005.10.006 (retrieved October 22, 2017).

Purpose: The ELSS was developed to measure learning success from the perspective of the learner. It is intended to measure various facets of learning success beyond user-satisfaction or successful completion of the learning module. Although the instrument was developed for use by companies that offer online learning modules, it may also be used by instructors at postsecondary institutions to identify whether intended learning outcomes have been met.

Description: The ELSS consists of 36 items, two of which are global items asking the user for their perceptions of overall success and overall performance of the learning system. All items are rated on a seven-point Likert scale from strongly disagree to strongly agree.

Development and validation: The theoretical framework upon which the scale was developed was based on research on information systems, of which e-learning systems are a category. Item development began with a review of the literature on information system success, user performance and satisfaction, service quality, web quality, and benefits to the organization. This review resulted in an initial draft of 46 items representing six dimensions: System Quality, Information Quality, Service Quality, System Use, User Satisfaction, and Net Benefit. Twelve experts in the field were surveyed and interviewed to ensure that no relevant factors were omitted. This panel of experts then reviewed the draft and recommended the removal of 15 items due to redundancies, and made suggestions for the addition of three other items. This process resulted in a 36-item scale that included two global items: perceived overall performance and perceived overall success of the learning system.

To validate the measure, a sample of 206 responses to the survey was gathered from several businesses that utilize e-learning systems in Taiwan. Using item-to-item correlation, the authors determined which items should be deleted from the scale. The criteria for deletion was a value of 0.40, but all items were above this level and were therefore retained. Overall

reliability for the scale was a CA of 0.96. An EFA was then conducted to determine the factor structure of the scale. Prior to the analysis, Bartlett's test of sphericity and KMO were computed. Both revealed acceptable levels to allow FA to proceed. A PCA with a varimax orthogonal rotation was then conducted. All items loaded above a coefficient of 0.50 and were therefore retained. The 34 scale items loaded onto the six theoretical dimensions, thereby confirming the factor structure. With this process both construct and content validity was established. The authors further assert that since all items loaded onto factors, unidimensionality is confirmed, and because there were no items loaded on any other factor, discriminant validity was assured. Criterion-related validity was established through correlations of the score totals with scores on the global items. The correlations were positively significant at 0.82. The authors reported that discrepant validity was determined by looking at the degree to which individual items were correlated with other items on other factors. Although 176 violations to discriminant validity were counted (out of 928), the benchmark for these counts was not exceeded.

Full text access: Full text of the scale appears in the appendix of the source.

*

TEST OF ONLINE LEARNING SUCCESS (TOOLS)

Source: Kerr, M. S., Rynearson, K., and Kerr, M. C. (2006). Student characteristics for online learning success. *Internet and Higher Education, 9*, 91–105.

Purpose: The TOOLS measures the traits of students who have been observed to contribute to success in online learning. The measure can be used to determine whether a student is ready for online learning, whether they possess the appropriate characteristics to do well in an online course, and what abilities are needed for doing well in an online course. The survey may be taken by a student for a self-assessment or administered by instructors to determine readiness.

Description: TOOLS includes 45 items on five subscales: computer skills, independent learning, dependent learning, need for online delivery, and academic skills. The higher the score, the higher the demonstrated skills.

Development and validation: To develop the list of items for the TOOLS the authors surveyed 50 randomly sampled institutions to ascertain whether they offered online classes and had a self-report student assessment. Thirty of these institutions met the criteria and shared their surveys with the authors. Through analysis of these surveys, issues related to student success were identified. An initial list of 428 items from these surveys was generated, 68 of which were unique. Because most of the items overlapped on more than one institution's survey it would be fair to surmise that most institutions value similar characteristics of student success. Based on 50 of the 68 unique items, the researchers wrote simple statements that reflected a behavior rather than an attitude or belief. The items were sorted into six categories: computer skills, time management, motivation, academic skills, the need for online delivery, and learning skills. The authors then verified that these categories were related to the overarching construct of student achievement through a literature search.

To determine the validity of the TOOLS, the survey was deployed to 188 students. Additionally, students were asked to fill out the Rosenberg Self-Esteem Scale (Rosenberg, 1965), The Index of Learning Styles (Soloman & Felder, 1999), Metacognitive Reading Strategies Questionnaire (MRSQ; Taraban et al., 2000), The Academic Intrinsic Motivation Questionnaire (Shia, 1998), and the Trice Academic Locus of Control Scale (Trice, 1985). An FA was employed to determine the factor structure. Initially 13 factors emerged; therefore the researcher forced the items into five factors. Items loading at or above 0.35 were retained, resulting in five

items being removed. Pearson product-moment correlations were computed to determine whether the TOOLS related to self-esteem, intrinsic motivation, reading comprehension, and locus of control (as measured in the above instruments). Although scores on the TOOLS were significantly correlated to self-esteem and reading strategy use, learning success was not related to intrinsic motivation and locus of control. After these procedures, five subscales were created: computer skills, independent learning, need for online learning, academic skills, and dependent learning. Further analyses revealed that students with higher self-esteem were more likely to be independent learners and demonstrate good reading and writing skills.

The second phase of validation involved deploying the 45-item measure to 92 students. In addition to the revised version of the TOOLS, the MRSQ and a computer self-efficacy questionnaire were administered. A second FA revealed similar results to the initial FA with similar factor structures. The CA for the entire scale yielded a value of 0.84, with alphas ranging from 0.63 to 0.84 for each individual item.

To assess criterion validity, overall scores on the TOOLS and the five subscales scores were correlated with scores on the internet self-efficacy and MRS subscales. Online learning success was found to be positively related to all the measures. Predictive validity was established by examining the course scores of a sample of the participants. High and low groups, based on TOOLS scores, were created for each subscale. This allowed the researchers to conduct independent-samples t-tests to determine whether there were significant differences on end-of-course grades. Students with high independent learning scores had higher grades than the low independent learning scores group. A regression was conducted to determine the extent to which end-of-course grades were explained by the TOOLS subscales. From these analyses, it was determined that only the academic skills subscale was a significant contributor to course scores. These procedures also provided the information needed to determine scoring scales. Scores below 177 indicate that the student needs to develop related skills prior to taking online courses. Analysis of subscales scores can help determine where remediation is necessary. See the TOOLS website for further information: http://www.txwescetl.com/test-of-online-learning-success-tools/ (retrieved October 22, 2017). Tutorials and tips for students are also offered on this website.

Full text access: Students or researchers wishing to use the TOOLS should visit this website: http://www.txwescetl.com/about-distance-ed/for-students/ (retrieved October 22, 2017).

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EVALUATION OF WEB-BASED COURSES

Source: Stewart, I., Hong, E., and Strudler, N. (2004). Development and validation of an instrument for student evaluation of the quality of web-based instruction. *American Journal of Distance Education*, *18*(3), 131–150.

Purpose: This survey is intended for student evaluation of online courses. The data gleaned from instructor deployment of this instrument can facilitate course redesign to improve students' satisfaction. At the time of its publication in 2004, the authors claimed that there were no published student surveys that demonstrated construct validity.

Description: The instrument includes 44 items on seven subscales: instructor and peer interaction, technical issues, appearance of web pages, hyperlinks and navigation, content delivery, online application, and class procedures and expectations. Participants responded to statements on a five-point Likert scale from strongly disagree (1) to strongly agree (5). An additional choice of nine was included to represent "not applicable." For the online applications dimension, students were asked to respond whether items in a list of applications were easy to use or not.

Development and validation: This instrument was developed based on a six-step process that begin with a survey (based on Biner, 1993) asking students to list as many factors that they believe would influence the efficacy of their online mathematics course. This survey was then distributed to 111 students and three instructors who were enrolled in an online math course at a community college. The list of items derived from this procedure resulted in 44 items representing seven factors: instructor and peer interaction, technical issues, appearance of web pages, hyperlinks and navigation, content delivery, online application, and class procedures and expectations. The next phase included a literature review to explore an overarching framework that ultimately comprised web-based tools, instruction, and interactions between learners and instructors. The literature review confirmed the dimensions identified in the initial student survey as well as an additional dimension the authors termed "presence of instructor and peers." This version of the scale was then reviewed by experts in psychological testing and web-based instruction for clarity. From these processes a 63-item scale emerged.

To support content validation, four professors in educational technology reviewed the scale and were asked to place each item in its

corresponding dimension. This process resulted in four items being removed and the renaming of some of the factors. Eight student volunteers were then asked to review the scale. and this resulted in further changes.

The scale was then deployed to over 1,400 participants for data collection. Both maximum likelihood method and PCA using varimax rotation and oblimin rotation were employed to determine factor structure. The extraction was limited to seven factors and those factors with an eigenvalue greater than 1.0. Items that loaded on 0.30 or greater were retained. The results of the ML analysis did not yield results that logically comported with the results of the literature review and were therefore rejected. The PCA, however, did yield results that supported the structure of the initial questionnaire. The scale was ultimately refined to pair items with high loadings in the appropriate and most logical subscale. CAs for each subscale ranged from 0.75 to 0.92.

Full text access: Full text of the instrument is available below with permission. More information about the scale is available on Stewart's website: http://sites.csn.edu/istewart/Quest/intro.htm (retrieved October 22, 2017).

*

Instrument for Student Evaluation of Web-Based Instruction

Response format: 1 = Strongly Disagree; 2 = Disagree; 3 = Undecided; 4 = Agree; 5 = Strongly Agree; 9 = Not Applicable (for some questions)

Note: *** means that the option "Not Applicable" is a viable choice.

****

Web-Based Course Evaluation

Following are questions that pertain to the Internet course that you are presently taking! Don't worry, responding to the questions will only take 10 minutes of your time!

Please type the name of the course that you are evaluating:

_____

Appearance of Web Pages

Please use the mouse to click on the "circle" next to the response that best describes what you think of the appearance and structure of Web pages used in the course. A Web page is any information with its own Web address that appears on your computer screen. If you make a mistake, click on the correct choice and the previous answer will disappear.

1. The font (type face, size, style) used on the Web pages detracts from the content. ◯
2. The Web pages appear lifeless and dull. ◯
3. The Web pages are dominated by overly bold graphics or text. ◯
4. The color scheme of the Web pages interferes with text comprehension. ◯
5. The layout of the Web pages is uncluttered. ◯
6. The Web pages are overcrowded with hyperlinks. ◯
7. *** The Web pages contain unnecessary animated or blinking graphics. ◯
8. *** A considerable number of pictures or animations that are supposed to be on the Web pages are missing. ◯

Hyperlinks and Navigation

Please use the mouse to click on the "circle" next to the response that best describes what you think of the hyperlinks and navigation used in this course. Hyperlinks are the

Continued

buttons, graphs, or phrases that connect one Web page with another. Navigation is defined as the movement between Web pages. If you make a mistake, click on the correct choice and the previous answer will disappear.

9. *** The hyperlinks are clearly identifiable on the Web pages.
   Note: Hyperlinks are the buttons, graphs, or phrases that connect one Web page with another. ◯
10. *** Important information is easy to find on the Web pages. ◯
11. *** The hyperlinks clearly tell me what information I am connecting to. ◯
12. It is easy to locate a particular Web page from any other Web page. ◯
13. The layout of the course Web site is clear to me. ◯
14. *** The buttons in the WebCT course management system clearly tell me what function they perform (compose a letter, connect to chat rooms, etc.). ◯

Technical Issues

Please use the mouse to click on the "circle" next to the response that best describes what you think of your access to course components and viewing of course materials. If you make a mistake, click on the correct choice and the previous answer will disappear.

15. The following online course media quickly loads to my home computer:
    a. *** Video Presentations ◯
    b. *** Audio Presentations ◯
    c. *** Pictures or Animations ◯
    d. Web pages ◯
16. The technical quality of the following online course media is good:
    a. *** Video Presentations ◯
    b. *** Audio Presentations ◯
    c. *** Pictures or Animations ◯
    d. *** Interactive Computer Video Conferencing (CUseeME, etc.) ◯

Online Applications

Please use the mouse to click on the "circle" next to the response that best describes what you think of the ease of use of ONLINE applications. If you make a mistake, click on the correct choice and the previous answer will disappear.

17. The following ONLINE applications are easy to use:

a. *** Video Player ◯
b. *** Audio Player ◯
c. *** Interactive Computer Video Conferencing System ◯
d. *** Chat Rooms ◯
e. *** Bulletin Board ◯
f. *** Private E-Mail System ◯
g. *** White Board ◯
h. *** Tutorials ◯
i. *** Simulations ◯
j. *** Plug-ins (other than video or audio player) ◯

Class Procedures and Expectations

Please use the mouse to click on the "circle" next to the response that best describes what you think of the procedures guiding the course and the instructor's expectations of you. If you make a mistake, click on the correct choice and the previous answer will disappear.

18. I know exactly what actions to take in the event of technology-related problems. ◯
19. In the beginning of the semester, I was given enough time to become familiar with the technology. ◯
20. I am told exactly how to turn in each assignment. ◯
21. *** I am given reasonable alternatives to scheduled "fixed time" activities (chats, tests, field trips, etc.). ◯
22. The grading procedures are clearly stated. ◯
23. The directions for completing assigned tasks are confusing. ◯
24. The due dates and deadlines are clear to me. ◯
25. In the beginning of the semester, I was told exactly what is expected of me as a student in an Internet course (learning style, academic and technical requirements, etc.). ◯

Continued

Content Delivery

Please use the mouse to click on the "circle" next to the response that best describes what you think of the manner in which the course material was presented to you. If you make a mistake, click on the correct choice and the previous answer will disappear.

26. The course content is delivered with appropriate media. Note: Media includes printed materials, audio, video, pictures, animations, etc. ◯
27. *** The instructor provides enough examples to allow me to better understand the subject matter. ◯
28. *** The assigned tasks increase my comprehension of the subject matter. ◯
29. *** I am given useful resources for extra practice or for expanding my knowledge (online tutorials or libraries, content-related Web sites, etc.). ◯
30. The instructional methods used in this course help me learn the subject matter. Note: Instructional methods may include lectures, case studies, discussions, group work, etc. ◯
31. The assessment activities (tests, quizzes, essays, presentations, etc.) contribute to my knowledge of the subject matter. ◯
32. The materials used to present the subject matter reflect the personal touch of the instructor. ◯

Instructor and Peer Interaction

Please use the mouse to click on the "circle" next to the response that best describes what you think of the manner in which you and your instructor and peers interact with each other. If you make a mistake, click on the correct choice and the previous answer will disappear.

33. The instructor communicates with me in a thoughtful manner. ◯
34. The messages from the instructor are clear to me. ◯
35. The instructor uses an informal conversational style (uses humor, is folksy, etc.). ◯
36. The instructor encourages proper communication among students (teaches Internet etiquette or behavior during discussions, etc.) ◯
37. *** The instructor confirms in a timely manner that assigned tasks have been received. ◯
38. I can count on the instructor to clear up quickly any confusion that I may have with a topic. ◯

39. The instructor makes an effort to ask me how I am doing. ◯

40. I am encouraged to get in touch with the instructor when questions or concerns arise. ◯

41. The instructor responds to my messages in a timely manner. ◯

42. *** The instructor is difficult to reach when WebCT is unavailable. ◯

43. *** The instructor's participation in mandatory discussions (in chat rooms, on the bulletin board, etc.) is poor. ◯

44. I am encouraged to communicate with my peers. ◯

Student Background

Thank you for completing the survey. Your responses will be very helpful in my attempt to improve the quality of Web-based instruction. The following background questions will help me to better evaluate the results. If you make a mistake, click on the correct choice and the previous answer will disappear.

Please use your mouse to first click on the next two (2) text fields, then type the information.

Gender

Age

For the next three (3) questions, please use the mouse to click on the "circle" next to the response that best describes you.

1. Have you taken the prerequisite(s) for this course?
   - Yes ◯
   - No ◯
   - I don't know ◯
   - Prerequisite(s) not required ◯

2. How many Internet courses utilizing WebCT have you taken prior to this course?
   - 0 ◯
   - 1 ◯
   - 2 or more ◯

3. Are you predominantly using a home computer for this course? Yes ◯ No ◯

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ONLINE LEARNING ENVIRONMENTS (OLLES)

Sources: Clayton, J. (2009) *Evaluating online learning environments: The development and validation of an online learning environment instrument.* Lambert Academic Publishing, Koln, Germany. ISBN 978-3-8383-0156-3

Clayton, J. (2007). The validation of the online learning environment survey. In *ICT: Providing choices for learners and learning. Proceedings ascilite Singapore 2007.* http://www.ascilite.org.au/conferences/singapore07/procs/clayton.pdfPurpose:

Purpose: Data derived from using the OLLES can inform instructors, course designers, and researchers as to effective instructional techniques in online learning environments.

Description: The OLLES contains a five-question demographic section and seven subscales each with five statements. Each statement is rated on a scale indicating how often the participant engages in the named activity from "almost never" to "almost always." The subscales include student collaboration, active learning, computer competence, information design and appeal.

Development and validation: Clayton investigated the categories of student interactions with other students, media and content, tutors, and interfaces as well as student reflection activities as a basis for developing the OLLES. After reviewing other older instruments on learning environments that were developed prior to 2001, the OLLES was created to assess student perceptions of learning environments in a distance education context.

Clayton solicited participants by contacting instructors who included some online learning in their courses. Two hundred and eighty-four students filled out the OLLES. To determine the factor structure and relationships between scales, a PCA using varimax and oblimin rotations was conducted on the data. Because the scale was developed with seven subscales, a seven-factor solution was investigated. Seven factors were identified using a scree plot and by analyzing eigenvalues. All items, except two, loaded at or above the cutoff of 0.40. Those two items loaded slightly above 0.40 on other factors in addition to the assigned one. The seven scales explained 65.75 percent of the variance in scores. The reliabilities

for each subscale were computed using Cronbach's alpha. The alphas ranged from 0.75 to 0.94 for the scales, with active learning rating the highest alpha. Discriminant validity of student collaboration and computer competence was 0.20, indicating that the scales were not measuring the same variables. The other five subscales revealed ranges of 0.35 to 0.39.

*

OLLES

Instructions: This survey contains two sections. Section one, personal details, contains 5 questions and is used for statistical purposes only. Participants cannot be identified in any way. Section two, scales and items, contains statements about practices which could take place in your 'online' course. You will be asked how often each practice actually takes place in the course.

Section 1: Personal Details: The personal information requested in this section of the survey is for statistical purposes only. Your answers to questions will remain confidential and you will not be identified in any way.

Gender
- ◯ Male
- ◯ Female

Your age
- ◯ 15–19
- ◯ 20–24
- ◯ 25–29
- ◯ 30–34
- ◯ 35–39
- ◯ 40–44
- ◯ 45–50
- ◯ over 50

I use my computer
- ◯ daily
- ◯ 3 times a week
- ◯ once a week
- ◯ once a month

I use the internet
- ◯ daily
- ◯ 3 times a week
- ◯ once a week
- ◯ once a month

Continued

I log on to my online course
- ○ daily
- ○ 3 times a week
- ○ once a week
- ○ once a month

My course name _____

The remaining part of this survey contains statements about practices which could take place in your online unit. You will be asked **how often** each practice **actually** takes place in the course. Think carefully about how each statement describes what this unit is **actually** like for you. There are no 'right' or 'wrong' answers. Your opinion is what is wanted.

- ○ Like a great deal
- ○ Like a moderate amount
- ○ Like a little
- ○ Neither like nor dislike
- ○ Dislike a little
- ○ Dislike a moderate amount
- ○ Dislike a great deal

Student Collaboration

I communicate regularly with other students in this course.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

I often ask other students for help in activities we are doing.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

Other students provide feedback on activities I have done.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

I share resources and information with other students.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

Other students share resources and information with me.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

Computer Competence

I am confident and competent using a computer.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

I am confident in using the internet to search for information.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

I am able to reconnect to the network if anything goes wrong.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

If necessary I can select and print documents from the internet.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

If necessary I can electronically store information on my computer.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

Active Learning

The feedback I receive from activities/quizzes is meaningful.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

The feedback from activities/quizzes helps me to locate where I am having difficulties.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

I am motivated by the responses I get from the activities/quizzes included in this course.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

Continued

The activities/quizzes provided in the course enhance my learning.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

The responses to the activities help me understand where I am having difficulty.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

Tutor (Instructor) Support

The tutor encourages my participation.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

The tutor responds promptly to my queries.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

The feedback I receive from my tutor helps me identify the things I do not understand.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

The tutor addresses group queries promptly.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

The tutor participates regularly in group discussions.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

Information Design and Appeal

The choice of colors and style used in the text assisted my being able to read clearly.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

The backgrounds used in tables and pages enhance the look of the material.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

The material shows originality and creativity in the layout.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

I find the graphics (photos, images and graphs) used are well designed and visually appealing.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

I find the graphics (photos, images and graphs) used are appropriate to the text and help me understand.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

Material Environment

The instructions provided to use the tools within the site are clear and precise.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

The software I use is suitable for participating fully in the course.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

I am able to install the appropriate software needed to participate in this course with ease.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

All software applications needed to participate in this course are provided.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

Continued

There is little delay in opening and using the software applications used in this course.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

Reflective Thinking

I find using the internet for learning is stimulating.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

I have no problems accessing and going through the materials on my own.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

I feel I am in control of my learning as I review the material provided.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

I feel the web based learning approach can substitute for, or enhance, the normal classroom approach.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

I feel I learn more in the online environment.

Almost Never	Seldom	Sometimes	Often	Almost Always
○	○	○	○	○

Reprinted with permission, Clayton, J. (2009) *Evaluating online learning environments: The development and validation of an online learning environment instrument.* Lambert Academic Publishing, Koln, Germany. ISBN 978-3-8383-0156-3.

SOCIAL PERCEPTIONS IN LEARNING CONTEXTS INSTRUMENT (SPLCI)

Source: Slagter van Tryon, P. J. and Bishop, M. J. (2012). Evaluating social connectedness online: The design and development of the Social Perceptions in Learning Contexts Instrument. *Distance Education*, *33*(3), 347–364. http://doi.org/10.1080/01587919.2012.723168 (retrieved October 22, 2017).

Purpose: The SPLCI may be used to measure students' perceptions of the extent of their social connectedness with other students and instructors in an online course. Social cognition drives the behaviors of students or participants during an interaction and therefore provides the underlying context of social connectedness in an online course. These behaviors are often predicated on a student's perception of what the "next move" should be in a social interaction. The SPLCI is intended to be used to assess social connectedness in computer-mediated contexts where social cues normally present in face-to-face environments may be lacking. This tool can be used to measure student perceptions "of the social connectedness that leads to the development of group social structure among participants in online courses" (2012, p. 348).

Description: The SPLCI includes 26 items rated on a five-point Likert scale asking students to rate the degree of agreement with a statement, preceded by the phrase "I had enough information about the other class participants to . . ." from strongly disagree to strongly agree. Items fell into three separate subscales: status assessment, norm development, and role differentiation. An example of status assessment includes "I had enough information about the other class participants . . . to decide who would be most able to help me if I had a course-related problem." An item on the norm development subscale includes "to imagine what amount of interaction there would be if I were at a small seminar with this group of students." And an item on the role differentiation scale asks participants to decide which participant would mostly likely take on a specific role in the group (e.g., the student to demonstrate the strongest work ethic, the most opinionated, the most effective leader: p. 355).

Development and validation: The initial development of the instrument resulted from an extensive review of the literature on the construct of "immediacy" in online contexts – termed "e-mmediacy" – by the authors. Immediacy refers to verbal and non-verbal cues perceived by the learner that reduce the feeling of distance between participants in a computer-mediated environment (e.g., DL course). The author identified three strategies for facilitating social connectedness – status assessments, norm

development, and role differentiation. Therefore, the items on the survey were developed to ask participants about their perceptions about others in the group as opposed to asking students to assess the strategies employed by the instructor to facilitate connectedness. In this way, the researchers are able to assess whether connectedness occurs or whether the instructor attempted to create an environment that would encourage connectedness.

After the literature review the authors consulted an expert in distance education instructional design to evaluate the initial 27 items on the scale. Each item was assessed to determine whether it consistently represented the construct being measured and for clarity. To establish face and content validity, five reviewers in psychology, social psychology, and instructional design reviewed the items. The reviewers also offered feedback on each item and an effectiveness rating. This procedure resulted in 26 remaining items. The instrument was then piloted with 50 students, 25 students each in both a F2F and online course. The Paulhus Deception Scale (Paulhus, 1991) was deployed simultaneously to evaluate discriminant validity of the instrument. The PDS comprises two constructs that are not related to "e-mmediacy." The additional purpose of administration of the secondary instrument was to determine whether students were likely to answer questionnaires with a particular bias. Two weeks after the initial pilot, the survey was readministered to the participants in order to assess test–retest reliability.

After the data were collected and analyzed the instrument was further modified. T-tests were also utilized to determine whether there were significant differences between groups (F2F and online) on the scores. No differences were found between groups on the instrument total score or on the subscales. Psychometric properties, reported below, were then calculated.

Cronbach's alpha was used to determine internal consistency. The CA for the entire scale (the second administration) was CA = 0.94, and the subscales ranged from 0.84 to 0.86. Pearson product moment was used for test–retest reliability and resulted in a strong correlation between the first and second administration of the full scale ($r = 0.61$) but did not meet the authors' benchmark of a value greater than 0.70. Pearson's product moment was also used to evaluate discriminant validity. The mean scores of both the SPLCI and the PDS were correlated below the benchmark of 0.50 – therefore providing evidence of discriminant validity.

Full text: Full text of the SPLCI appears below.

*

SPLCI / SA

Directions: Read each statement below and think about it in relation to your most recent class experience. Decide the extent to which you agree with that statement and circle the appropriate number in the column to the right of each statement that corresponds with your response.

I had enough information about the other class participants . . .

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	SA/ Total
1. to have a sense of how others would respond during interactions.	1	2	3	4	5	
2. to know if some of my fellow classmates were more interesting to me than others.	1	2	3	4	5	
3. to rate other's academic strengths/weaknesses.	1	2	3	4	5	
4. to decide who would be most **able** to help me if I had a course-related problem.	1	2	3	4	5	
5. to decide who would be most **willing** to help me if I had a course-related problem.	1	2	3	4	5	
6. to have a sense of how friendly others in the class were (friendly defined as warm or comforting).	1	2	3	4	5	
7. to determine who possessed the necessary technology to participate fully in this course.	1	2	3	4	5	
8. to determine who possessed the necessary technology skills to participate fully in this course.	1	2	3	4	5	
	SUM	SUM	SUM	SUM	SUM	
	___ +	___ +	___ +	___ +	___ =	____

Continued

SPLCI / ND

Directions: Read each statement below and think about it in relation to your most recent class experience. Decide the extent to which you agree with that statement and circle the appropriate number in the column to the right of each statement that corresponds with your response.

I had enough information about the other class participants . . .

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	ND/ Total
9. to imagine what amount of interaction there would be if I were at a small seminar with this group of students.	1	2	3	4	5	
10. to know how much interaction to expect from the others in this course.	1	2	3	4	5	
11. to know how individuals in the class would respond if I told them I did not understand what we were studying.	1	2	3	4	5	
12. to determine how the others would respond if I did not communicate with them during class discussions for an extended amount of time.	1	2	3	4	5	
13. to determine if this group kept up with the course assignment due dates.	1	2	3	4	5	
14. to determine which individuals knew the class rules for how to behave and interact in the class.	1	2	3	4	5	
15. to determine which individuals knew how we were expected to interact with the instructor.	1	2	3	4	5	
16. to know what would happen if someone did not comply with expected group behaviors.	1	2	3	4	5	
17. to know more about them than just their names.						
	SUM	SUM	SUM	SUM	SUM	
	___ +	___ +	___ +	___ +	___ =	____

SPLCI / RD

Directions: Read each statement below and think about it in relation to your most recent class experience. Decide the extent to which you agree with that statement and circle the appropriate number in the column to the right of each statement that corresponds with your response.

I had enough information about the other class participants . . .

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	RD/ Total
18. to decide who would be the most effective leader of the group.	1	2	3	4	5	
19. to decide who was the most opinionated person in the group.	1	2	3	4	5	
20. to decide who was most likely to be frustrated with the learning environment.	1	2	3	4	5	
21. to decide who had the strongest work ethic in this course.	1	2	3	4	5	
22. to decide who would be the best motivator for the group.	1	2	3	4	5	
23. to determine who participated the least in the group.	1	2	3	4	5	
24. to select with whom I would work best.	1	2	3	4	5	
25. to group others into effective teams.	1	2	3	4	5	
26. that given a list of statements, I would be able to identify with confidence which person made which statement.						
	SUM	SUM	SUM	SUM	SUM	
	___ +	___ +	___ +	___ +	___ =	____

Continued

SPLCI Participant Scoring Grid

Participant # _____

Participant Status Assessment			**SA TOTAL**	
Very Low	Low	Moderate	High	Very High
8	**9 - - - - - 20**	**21 - - - - - - 27**	**28 - - - - - - 35**	**36 - - - - - 40**

Participant Norm Development			**ND TOTAL**	
Very Low	Low	Moderate	High	Very High
8	**9 - - - - - 23**	**24 - - - - - - 30**	**31 - - - - - - 40**	**41 - - - - - 45**

Participant Role Differentiation			**ND TOTAL**	
Very Low	Low	Moderate	High	Very High
8	**9 - - - - - 23**	**24 - - - - - - 30**	**31 - - - - - - 40**	**41 - - - - - 45**

Participant Full Scale			**FULL SCALE TOTAL**	
Very Low	Low	Moderate	High	Very High
24	**25 - - - - - 36**	**37 - - - - - - 95**	**96 - - - - - 113**	**114 - - - - - 130**

Reprinted with permission, Slagter van Tryon, P. J. and Bishop, M. J. (2012). Evaluating social connectedness online: The design and development of the Social Perceptions in Learning Contexts Instrument. *Distance Education 33*(3), 347–364.

ONLINE CONSTRUCTIVIST LEARNING ENVIRONMENT SURVEY (OCLES[20]) WITH DEMOGRAPHIC DATA

Sources: DeVaney, T. A., Adams, N. B., and Elliot, C. B. (2008). Assessment of online learning environments: Using OCLES(20) with graduate level online classes. *Journal of Interactive Online Learning, 7*(3), 165–174.

Johnson, B. and McClure, R. (2000). How are our graduates teaching? Looking at the learning environments of our graduates' classrooms. A paper presented at the annual meeting of the *Association for the Education of Teachers in Science*.

McClure, R. and Gatlin, L. (2007). Assessment of online learning environments using the OCLES(20). *National Social Science Journal, 28*(2), 127–132.

Purpose: The OCLES(20) was developed to collect student perceptions of teaching strategies to assess constructivist learning environments in online classes.

Description: The OCLES is a student self-report instrument that includes 20 items on a five-point Likert scale from 5 (almost always) to 1 (almost never). The instrument also includes demographic questions. The scale includes the following dimensions: relevancy, uncertainty, critical voice, shared control, and student negotiation. Examples of items include "I dialogue with other students about how to solve problems," and "I feel safe questioning what or how I am being taught" (p. 168).

Development and validation: The OCLES(20) was adapted from the CLES(20) which was developed from Johnson and McClure (2000) which was created to be used with high school math and science students in the early 1990s. The CLES had been modified to be used in distance education by McClure and Gatlin in 2007. It was field tested with doctoral students in an online program. DeVaney et al. (2008) modified the scale further to add demographic questions.

The survey responses were collected from 517 doctoral students in an online program. Factor analyses with Promax rotation were conducted on the data. All items loaded at a value greater than 0.40 with most values loading at greater than 0.70. The authors examined the results by female and male subsamples. The model for the females, the largest subsample

(n = 418), demonstrated the greatest explanation of variance at 71.28 percent. Reliability analysis for each factor ranged from 0.73 to 0.92. The total scale reliability was 0.89.

Full text: Both the items on the OCLES(20) and the demographic questions appear in tables within the source.

*

VIRTUAL LEARNING ENVIRONMENT SURVEY (VLES)

Source: Adams, N., DeVaney, T. A., and Sawyer, S. G. (2009). Measuring conditions conducive to knowledge development in virtual learning environments: Initial development of a model-based survey. *Journal of Technology, Learning, and Assessment, 8*(1), 1–24.

Purpose: The VLES measures the extent to which the Recursive Model for Knowledge Development impacts the design of online learning.

Description: The VLES is a self-report scale that assesses the student attitudes of teaching strategies, knowledge approach, and knowledge ownership.

Development and validation: The scale is based on Adams' Recursive Model for Knowledge Development in Virtual Environments (2007) which describes three dimensions that include knowledge authority, teaching approach, and knowledge approach. The VLES is based on the OCLES-20 (McClure & Gatlin, 2007) and the Constructivist On-Line Learning Environment Survey (Taylor & Maor, 2000), the Web-based Learning Environment Inventory (Chang & Fisher, 2001). The source describes the deployment of two surveys, 15 items from the OCLES-20 and another that included items from the other two surveys noted above. The surveys were collected from 86 students in a hybrid course. A factor analysis revealed a five-factor solution with an explained variance of 73.55 percent. All items loaded at greater than 0.60 except for one item. CA for the entire scale was 0.78.

An FA was conducted on the second survey that included 20 items on seven dimensions. The FA revealed five factors with items loading at or above 0.50. The total variance explained was 69.24 percent. One entire subscale was eliminated based on the loading criteria. Correlations between the OCLES-20 and the four subscales of the new survey revealed moderate relationships between some of the subscales.

Full text access: Full text of the surveys from which the items on the VLES were derived are included in the appendix of the source. Appendix A includes questions from the OCLES-20 and additional items from other surveys.

*

COMPETENCIES FOR DISTANCE TEACHING

Source: Darabi, A. A., Sikorski, E. G., and Harvey, R. B (2006). Validated competencies for distance teaching. *Distance Education, 27*(1), 105–122.

Purpose: Often faculty in higher education elect to teach online, whether or not they possess the qualifications, knowledge, or experience related to distance education. This study determines a validated list of competencies and tasks for teaching online. Use of this instrument by institutions can assist departments and instructors in making appropriate decisions with respect to staffing and instruction. Many, if not all, of the competencies determined for this study are also relevant to F2F teaching.

Description: This measure include 17 items rated on a five-point Likert scale which asks the participant to indicate the importance of each task from very high (5) to very low (1). Additionally, participants are asked to rate the amount of relative time spent on each task from 5 (much more) to 1 (much less). Examples of tasks include "Review the course for accuracy," "Maintain record-keeping," "provide feedback to learners" (p. 111).

Development and validation: Using the International Board of Standards for Training, Performance and Instruction (IBSTPI) and a review of the literature, the authors developed a list of items reflective of tasks conducted by faculty who teach online. This list and the accompanying performance statements were then reviewed by 18 distance learning experts. This review resulted in a list of 54 task statements. This list was then sent to 148 instructors, in the U.S., Canada, the Netherlands, and Australia, to be rated for importance, frequency of performance, and the amount of teaching spent each week on each task. These processes resulted in a 17-item list of competencies representing tasks performed by 90 percent of the instructors surveyed that are most commonly performed each week.

Full text access: The list of competencies appears within the text and the appendices of the source.

*

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CHAPTER 4

Student Learning and Behaviors

Student behavior, teacher effectiveness, and student perceptions of learning are all important variables impacting student success. This chapter includes surveys of student technology and social media use in online courses. Additionally, technology use is examined across age spans and experiences such as in the example below.

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ONLINE COOPERATIVE LEARNING ATTITUDE SCALE (OCLAS)

Source: Korkmaz, O. (2012). A validity and reliability study of the Online Cooperative Learning Attitude Scale (OCLAS). *Computers & Education, 59,* 1,162–1,169.

Purpose: While cooperative learning is a commonly used educational strategy in F2F learning, it also can be used effectively in online contexts. However, it has been reported that students are more reluctant to participate in cooperative learning in online courses, thereby hindering the usefulness of the strategy. The OCLAS assesses student attitudes toward cooperative learning in distance education. Data gleaned from using this scale can help instructors glean student attitudes and adjust activities accordingly.

Description: The OCLAS includes 17 items rated on a scale of 1 (never) to 5 (always), with respect to agreement with the statements. The items fall into to two subscales: positive attitudes and negative attitudes.

Development and validation: The development of the scale was preceded by a literature review focusing on attitudes toward cooperative learning in F2F courses (Gottschall & Garcia-Bayotms, 2008; Huang et al., 2011; McLeish, 2009; Nam & Zellner, 2011; Tseng et al., 2010; Veenman et al., 2000). Items for the OCLAS were adapted from these scales. Additionally, 22 students who had participated in cooperative learning assignments in online classes were asked to write about their thoughts on the experience. The author analyzed these writings and added items to the draft. Content validity was established through an expert review panel that included a psychologist and educational technologists as well as a Turkish language expert to assure linguistic clarity. Through these procedures, a 30-item draft was composed. Face validity was assessed by a panel of 22 students who checked for clarity.

The survey was administered to a total of 599 undergraduate students in Turkey in computer education and instructional technology departments. KMO and Bartlett's tests were used to determine whether FA was appropriate for the data set. The KMO was over 0.90 and Bartlett's was significant, indicating that analyses could proceed. Principal component analysis with varimax rotation was utilized. Items loading lower than 0.30 and that loaded onto two factors were removed. The variance explained by this model was 51.50 percent. After this iteration,the new scale was

deployed to a new group of students. These data were analyzed using the maximum likelihood method in the CFA. Several model fit values were collected: RMSEA, S-RMR, NNFI, CFI, GFI, AGFI, IFI. The GFI and AGFI had values indicating an acceptable and perfect fits respectively. Discriminant validity was calculated by using a t-test to compare the values of the lowest 27 percent scores to the highest 27 percent of scores. The findings indicated significant differences in these two groups. Internal consistency reliability indicated a value of CA of 0.902, split half values were 0.878 and 0.823. Spearman-Brown was 0.792.

Full text: Full text may be found within the text of the source.

*

STUDENT ATTITUDES TOWARD ONLINE COOPERATIVE LEARNING

Source: Nam, C. W. and Zellner, R.D. (2011). The relative effects of positive interdependence and group processing on student achievement and attitude in online cooperative learning. *Computers & Education, 56*, 680–688.

Purpose: This scale was developed to assess student attitudes toward cooperative learning strategies in online context as part of a study to assess interdependence and group processing and its effect on achievement. Students were assigned to one of three treatment groups: positive interdependence, group processing, and a "no structure" control group. Because cooperative learning has been shown, in some models, to improve achievement, this model's efficacy should be assessed.

Description: The scale includes 14 items that are answered on a five-point Likert scale from strongly agree to strongly disagree. Examples of items include, "I was able to interact with other students more positively and often because I had a complementary and interconnected role in my group" (p. 685).

Development and validation: Although development information is given in the source, psychometric tests are reported. Participants included 144 undergraduate students in South Korea who were enrolled in online education and business courses. Principal component analysis was conducted on the data to examine the factor structure and other indices of validity. KMO was 0.84, indicating the FA was appropriate for this data. The total variance explained by the scale scores was nearly 52 percent. Four factors were extracted using varimax rotation. Factors for the first two components loaded at or above 0.40; however, analysis of the other two components did not indicate clear loadings on their factors and were therefore not included in the study.

Full text: Full text of the items appears in a table within the source.

*

E-LEARNING ACCEPTANCE MEASURE (EIAM)

Source: Teo, T. (2010). Development and validation of the E-learning Acceptance Measure (EIAM), *Internet and Higher Education, 13*, 148–152.

Purpose: This scale gauges users' reactions to e-learning and can assist course designers and instructors to develop courses that assist students in learning more effectively.

Description: The EIAM includes 21 items on three subscales which include tutor [instructor] quality, perceived usefulness, and facilitating conditions. Participants rate their agreement with statements on a scale from one to seven. The subscale items perceived usefulness and were preceded by an item stem "Because of what I have learnt from the course" (p. 152).

Development and validation: Items for the EIAM were generated through a review of the literature on the Technology Acceptance Model (TAM: Davis, 1989), which states that the user's intention to use a technology, which is affected by attitudes towards use, is an important factor determining its actual use, and the unified theory of acceptance and use of technology (UTAUT; Venkatesh et al., 2003), and course satisfaction. Additionally, items from scales that were identified from the literature and that measured similar constructs were used to develop the EIAM. An initial list of 40 items was reviewed by an expert panel of educational technology professors who have taught online. This review led to the revision or consolidation of several items, reducing the total number of items to 31. Subsequently, two groups of ten students were invited to attend a focus group to assess the items for clarity and meaning. This process reduced the list to 21 items.

The scale was then piloted with 197 student teachers. EFA using PCA was conducted on the data. All factors with an eigenvalue greater than 1 were examined. Three factors explained 87.9 percent of the variance in scores. All items loaded at or greater than 0.70 on all three factors. Two additional rotations, varimax and oblimin, were conducted to further confirm the factor structure.

The finalized scale was then deployed to 189 student teachers in graduate programs in an Asian country (not specified by the author). A CFA was conducted and MLE was used to confirm the presence of the three subscales. Model fit was assessed through minimum fit function,

× 9 squared)/df, with a value of less than 3.0, indicating an acceptable fit. Additionally, SRMR and the RMSEA had values of less than 8.0, indicating an acceptable fit. CFI and TLF also indicated an acceptable fit with values greater than 0.95. Alternate models were also investigated using SEM, results of which indicated that a three-factor model demonstrates the best fit.

Discriminant validity was weakly affirmed because interfactor correlations (0.60–0.67) indicated that the three factors may not be distinct from each other.

Full text access: Full text of the EIAM appears in the appendix of the source.

*

SATISFACTION IN ONLINE LEARNING: TECHNOLOGY ACCEPTANCE MODEL: ARABIC

Source: Al-Azawei and A. Lundqvist, K. (2015). Learner differences in perceived satisfaction of online learning: An extension to the Technology Acceptance Model in an Arabic sample. *The Electronic Journal of e-learning, 13*(5), 408–426.

Purpose: Learners may withdraw from online courses when they do not do well or do not have positive experiences; in particular, discomfort with technology is an inhibitor to learning. The Technology Acceptance Model was developed to predict users' intentions to accept technologies (whether in lieu of F2F classes or not), in order to perhaps predict online student satisfaction. This study examines the TAM with Arabic speakers in Iraq, a developing country. The author of this study also adapted the TAM to evaluate perceived satisfaction in an online course developed using the Felder and Silverman Learning Styles model (FSLSM).

Description: The scale includes 16 items on four factors, including online self-efficacy, perceived ease of use, perceived usefulness, and perceived satisfaction.

Development and validation: The author used several measures, including the index of learning styles as well as the scale developed to reflect TAM. Based on a literature review of concepts related to the author's modified TAM, the following concepts as they relate to technologies were investigated: online self-efficacy, perceived usefulness, perceived ease of use, and perceived satisfaction.

The scale was deployed to 144 computer science students enrolled in an online course. Analyses were run on these data to determine validity and reliability. The CA of the entire scale was 0.90. Pearson correlations were used to determine interscale relationships indicating significant and moderate correlations between all subscales, although multicollinearity was not violated. To be able to conduct factor analysis, some items must correlate at least 0.30. KMO was 0.815 and Bartlett's test was significant, indicating that data were appropriate for FA. Therefore, PCA was utilized to extract four factors that explained 69.90 percent of the variance. All items loaded on the appropriate factors at or above the cutoff of 0.50. Convergent and discriminant validity were established by assessing that the AVE and composite reliability (CR) values were higher than 0.50 and 0.70 respectively. Participants were 144 IT or computer science students who were enrolled in an online course.

Full text access: Full text of the scale appears in the appendix of the source (in English).

*

TeLRA

Source: Kisanga, D. H. and Ireson, G. (2016). Test of e-Learning Related Attitudes (TeLRA) scale: Development reliability and validity study. *International Journal of Education and Development Using Information and Communication Technology*, *12*(1), 20–36.

Purpose: The TeLRA was developed to assess teachers' attitudes towards e-learning. This particular scale was developed to be used cross-culturally. Most instruments were developed in technologically advanced countries, and the authors argue that the wording of these instruments does not meet the needs of users in less technologically equipped countries, such as Tanzania (where the TeLRA development and validation took place).

Description: The TeLRA includes 36 items over four factors. Responses were scored on a scale of 1 to 4 from strongly disagree to strongly agree. Several items were reverse worded.

Development and validation: The development of the TeLRA began with a review of the literature. Additionally, the authors reviewed the Test of Science Related Attitudes (TOSRA) and the Technology Acceptance Model (TAM). Items were written based on the TOSRA scale and the five characteristics of innovations (Rogers, 2003): relative advantage, compatibility, complexity, triability, and observability of a technology. Two additional items were added: "I believe e-learning will improve my job performance," and "Using computer systems requires a lot of mental effort." Five total factors were constructed and included: social implication of e-learning, benefits from e-learning, attitude toward e-learning, leisure interest in e-learning affairs, and interest in teaching through e-learning technologies. The scale was developed to be answerable by participants from various countries, cultures, and social situations.

The initial version of the TeLRA comprised 78 items. Validity testing began with assessing face and content validity by submitting the scale to experts. These experts evaluated the measure on clarity, representative coverage of each domain, complexity of items, and the amount of time it would take to complete the questionnaire. After this process 18 items were removed because they were considered ambiguous or duplicative of other items; other items were modified. The remaining 60 items were then tested for reliability with 30 pre-service teachers in England prior to pilot testing. The CA value was 0.877; however, 24 items were removed

because they had low item–total correlation which indicated that they were not measuring the constructs intended on the scale. This revision increased the reliability to 0.888, deeming the scale appropriate for further testing. The 36-item scale was then deployed to 26 teachers in Tanzania for pilot testing. This process revealed a CA of 0.871.

The main study involved sending paper surveys to 258 randomly selected teachers from four universities. To determine the underlying structure of the TeLRA, PCA was performed on the data. KMO was a value of 0.82, exceeding the threshold of 0.6, while Bartlett's test was significant at $p < 0.5$. These results deemed the sample appropriate for FA. Initial PCA indicated ten factors exceeding an eigenvalue of 1. The scree plot was also analyzed to determine where factors might emerge. A Parallel ANALYSIS was conducted which compared the eigenvalues with eigenvalues randomly generated by SPSS on a data set with the same number of variables and with the same sample size. From this analysis, five factors that explained 42.60 percent of the variance emerged. After these analyses, it was determined that only items that loaded at 0.50 or higher on a factor should remain, so the themes with only one item were merged with others. The resulting scale included 22 items on four factors. CA of this version of the scale indicated that one item reduced the reliability of one factor, so that item was removed, increasing the CA of the entire scale to 0.806.

Full text access: Full text of the TeLRA appears in Table 1 of the source.

*

ONLINE LEARNING APPROACH AND MENTORING PREFERENCES OF INTERNATIONAL DOCTORAL STUDENTS

Source: Strang, K. D. (2009). Measuring online learning approach and mentoring preferences of international doctorate students. *International Journal of Educational Research*, *48*(4), 245–257. https://doi.org/10.1016/j.ijer.2009.11.002. (retrieved October 23, 2017).

Purpose: The purpose of the study in the source was to examine the learning styles of international students. Strang reports that there is a dearth of research on cross-cultural teaching practices. Toward filling this gap, the instrument employed in this study measures learning and supervision approaches in the acquisition of a doctoral degree. Further, the study tests a theoretical model.

Description: The measure includes 30 questions on six factors described below; choices for each question are bionomial.

Development and validation: Strang developed a conceptual model based on his teaching experience and a literature review on the following aspects related to student preferences for approaches toward supervision and learning: mentor (andragogic or pedagogic), render (visual vs. textual learning preferences), interpret (sensing or intuitive), construct (active; e.g. hands-on vs reflective), and schemata (sequential or holistic). Measures such as the ILS (Soloman & Felder, 1999) were reviewed but deemed insufficient to answer the research question. A 30-question survey was developed that included six items for each five factors. The survey was tested with faculty focus groups, and student groups.

The study included 254 international students in Australia who were completing a doctorate in the management field. PCA was conducted after each deployment in order to refine the instrument. Ordinal factor analysis then followed when significant results were found. The PCA revealed five significant factors explaining between 61 and 98 percent of the variance. All items loaded at or above 0.50 on a single factor.

OFA using Ordinal Formal Inference Maximum Likelihood with the logistic response function was then employed because the responses for each item were binomial (ordinal). These procedures revealed a significant model in which the majority of items loaded above the threshold of 0.70 on the appropriate factor. All subscales demonstrated good reliability from 0.70 to 0.90. SEM was employed, and model fit indices were examined. Both indices were acceptable.

Full text access: Full text of the measure appears below.

*

Andragogy Learning Styles Scale

Teach

I believe experienced teachers should help students

(a) adjust their learning goals to best-practice curriculums. ☐
(b) adjust the curriculum content to their learning goals. ☐

I believe unstructured courses are best managed by

(a) having key report deadlines set in course outlines. ☐
(b) students creating a schedule for report deadlines. ☐

In structured courses, I believe

(a) teachers should provide a popular industry case study. ☐
(b) students should research a case study of practical interest. ☐

If course outlines are customizable, I prefer

(a) certification exam topics with graded problems. ☐
(b) relevant industry topics with self-study problems. ☐

I prefer teachers to include guest speakers from

(a) recent graduates, highlighting most critical theories. ☐
(b) existing industry workers, discussing new practices. ☐

When group work is marked as a single score I prefer

(a) randomly-formed teams to diversify skills and cultures. ☐
(b) student-picked teams to balance skills and cultures. ☐

Input

When explaining a complex idea, I prefer to

(a) draw a simple diagram, and talk about it. ☐
(b) write a few key topics, and talk about them. ☐

If given one choice for important meeting directions I need

(a) route plan in one picture, diagram or map. ☐
(b) route plan in voice mail or brief written note ☐

When learning from my textbook, I prefer to

(a) make notes on pictures and diagrams. ☐
(b) make notes on margin text and tables. ☐

I prefer teachers to present material with

(a) mostly diagrams and verbal explanations. ☐
(b) mostly text bullets and verbal explanations. ☐

Continued

For travel directions to a new place, I prefer

(a) a road map showing suburbs and streets. ☐
(b) written street-by-street and turn details. ☐

When someone is showing numeric data, I prefer

(a) summarized charts or graphs. ☐
(b) summarized text bullets or numeric tables. ☐

Perceive

Teachers and friends describe me as

(a) practical and procedural. ☐
(b) experimental and risk taking. ☐

I prefer to study material that has mostly

(a) formulas supported by numeric ratios and counts. ☐
(b) theories supported by conceptual circles and arrows. ☐

I find it easier to memorize and then talk about

(a) interesting facts backed by scientific evidence. ☐
(b) interesting ideas that could become very popular. ☐

When planning a vacation, I prefer the idea of

(a) having a tour guide and schedule of activities. ☐
(b) having a tour book and list of self-guided tours. ☐

Teachers are likely to report I am mostly

(a) careful about the details of my work. ☐
(b) creative about how I do my work. ☐

I prefer buying books that have a lot of

(a) concrete directly usable material (facts, numbers). ☐
(b) abstract customizable material (theories, models). ☐

Process

I learn new games better by first

(a) jumping in and practicing with friends. ☐
(b) reading instructions and observing friends play. ☐

When I am learning a new work process, I prefer to

(a) discuss the physical steps with the supervisor. ☐
(b) discuss the overall expectations with the supervisor. ☐

In a team working on a difficult project plan, I try to

(a) suggest all tasks needed for every deliverable. ☐
(b) periodically sequence all tasks accepted so far. ☐

When I start a homework problem, I am more likely to first

(a) start working on the solution immediately. ☐
(b) try to fully understand the outcome requirements. ☐

To write a software manual, I would rather first

(a) experiment, then plan the outline and content. ☐
(b) plan the outline and content, then experiment. ☐

When I have to work on a group project, I first want to

(a) brainstorm in a group where everyone ranks the ideas. ☐
(b) brainstorm individually and later rank ideas in a group. ☐

Understand

When learning new games, I tend to first

(a) master rules then later understand strategies ☐
(b) focus on strategies then gradually master rules. ☐

When assembling a new appliance from a box of parts I

(a) start with instructions, adding part by part. ☐
(b) examine final picture, then go through instructions. ☐

I prefer math textbooks that first discuss

(a) logic and formulas, then real-world examples. ☐
(b) real-world examples, then logic and formulas. ☐

It is more important to me that my teacher

(a) discuss most theories in a clear sequential process. ☐
(b) discuss key theories and relate them to previous subjects. ☐

When writing a paper, I am more likely to first

(a) write the beginning, and proceed sequentially to the end. ☐
(b) write different parts out of sequence, then assemble them. ☐

When learning a new subject, I prefer to

(a) focus on understanding new facts one step at a time. ☐
(b) focus on relating new facts to what I already know. ☐

Reprinted with permission, Strang, K. D. (2016). Testing young business students for technology acceptance and learning performance. *International Journal of Learning Technology*, 11(3), 238–265. (Retrieved 23 October 2017 from http://www.inderscience.com/info/inarticle.php?artid=79036.)

PERCEPTION OF STUDENTS TOWARD ONLINE LEARNING (POSTOL)

Source: Bhagat, K. K., Wu, L.Y., and Chang, C. Y. (2016). Development and validation of the perception of students towards online learning (POSTOL). *Journal of Educational Technology & Society*, *19*(1), 350–359.

Purpose: The POSTOL was developed to determine student attitudes toward online learning which can help instructors and instructional designers address issues that can improve student attitudes and experiences.

Description: The POSTOL is a 16-item scale covering four dimensions: instructor characteristics, social presence, trust, and instructional design.

Development and validation: The POSTOL items were developed through a review of the literature on existing online learning readiness scales and research on the subscales described above. The social presence items were based on research by Lim et al. (2008) and Sahin and Shelley (2008). The instruction design items were derived from Mullen and Tallent-Runnels (2006). The instructor characteristics items were based on House, Weldon, and Wysocki (2007) and Otter et al. (2013). After the 16-item scale was developed, a panel of experts reviewed each of the items on each dimension.

Further validity and analyses were tested on a sample of 208 responses of students in Taiwan. The data were analyzed for normality and skewness, which were within recommended limits. The KMO was a 0.896 and the Bartlett's test was significant, indicating that the FA was appropriate on this sample. To determine the factor structure, an EFA with PCA using varimax rotation was employed which revealed a model that explained 61.853 percent of the variance. All items loaded onto their factors at or above a coefficient of 0.60. A CFA was then employed which confirmed that the four-factor model was the best fit.

Composite reliability and average variance extracted were derived from the CFA. Convergent validity was assured in that all factor loadings were above 0.70 for each subscale (for the CFA) and the AVE should be above 0.50 for two of the subscales (social presence and instructional design). For discriminant validity, the authors used the metric of confirming that the square root of AVEs should be greater than the correlation of each factor to the other factors. To support discriminant validity these values should also be above 0.50. The CA of the entire scale was a value of 0.906. The CAs of the subscales ranged from 0.727 to 0.920.

Full text access: Full text of the POSTOL items appears below.

*

POSTOL

Subscale and item

Instructor Characteristics (IC)

IC 1	Instructors should be friendly and approachable.	☐
IC 2	Instructors should encourage student interactions.	☐
IC 3	Instructors should provide sufficient learning resources online.	☐
IC 4	Instructors should solve emerging problems efficiently.	☐
IC 5	Instructors should provide fast feedbacks to queries in the discussion forum.	☐

Social Presence (SP)

SP 1	This course would help me to use the Internet sources more efficiently.	☐
SP 2	I think sharing knowledge through online discussions is a good idea.	☐
SP 3	Online discussion enables students to exchange ideas and comments.	☐
SP 4	I would benefit from using interactive applications.	☐
SP 5	Browsing classmates' work would help to improve the quality of my own work.	☐

Instructional Design (ID)

ID 1	I differentiate between difficult and easier types of course content and study them differently.	☐
ID 2	I like to involve myself actively in group discussions.	☐
ID 3	Understanding the subject matter of this course is very important to me.	☐

Trust (TR)

TR 1	Online courses should provide a better learning experience than traditional courses.	☐
TR 2	I believe that I can earn a better grade in an online course than in a traditional course.	☐
TR 3	Students learn more in online courses than they learn in traditional courses.	☐

Reprinted with permission: Bhagat, K. K., Leon Yufeng Wu, and Chun-Yen Chang. (2016). Development and Validation of the Perception of Students Towards Online Learning (POSTOL). *Journal of Educational Technology & Society, 19*(1), 350–359.

CRITICAL THINKING IN ONLINE WRITINGS (CTOW)

Source: Ali, N. S., Bantz, D., and Siktberg, L. (2005). Validation of critical thinking skills in online responses. *Journal of Nursing Education, 44*(2), 90–94.

Purpose: This scale is used by online instructors to measure critical thinking skills in online writing. Although the scale was developed for use in evaluating writing in an online nursing program, the measure is generalized to the degree where it may be used in any discipline.

Description: The CTOW includes ten items covering the following constructs: analysis, synthesis, and evaluation. The measure is a rubric for which each item is rated from "not evident" (1) to "above average" (4). Scores can range from 10 to 40, with a higher score indicating greater critical thinking skills. Subscale scores may also be calculated individually.

Development and validation: The authors based the instrument on a definition of critical thinking developed by the critical thinking committee of the Ball State University School of Nursing. In short, critical thinking "is the process of analysis, synthesis, and evaluation of information as relevant to the discipline of nursing" (p. 91). A review of the literature on the three components included in the definition revealed traits, skills, behaviors, and attitudes of critical thinkers that formed the basis for the items in the CTOW. Specifically, the critical thinking skills as reported by the American Philosophical Association (1990) and Facione (1997) were incorporated.

The initial version of the scale included 13 items on a four-point Likert scale from 0-3. The authors demonstrated both face and content validity through the following procedures. Experts in the field of educational psychology and the applied sciences comprised a panel of experts to review the tool. This review resulted in the removal of three items and revision of three others.

The CTOW was deployed to 53 graduate nursing students who were taking one of three online courses. Each course included a module in which students responded to a scenario that required a written response. One such example described a communication issue between a student nurse and staff nurse. Although there were three different scenarios, the statement preceding the items on the scale, "resolve the case scenario using the critical thinking approach," allowed for consistent analysis of each

response. All students were provided with the institution's definition of critical thinking. Each response was graded by both the instructor and at least one of the authors of the measure. Interrater reliability was calculated for each item, resulting in agreement ranging from 54 percent to 81 percent, with the majority of agreement greater than 68 percent. Pearson correlations were computed for 26 randomly selected items that ranged from 0.68 to 0.879. Cronbach's alphas for the three subscales ranged between 0.68 and 0.979.

Full text: Full text of the instrument appears below with permission.

*

Critical Thinking in Online Writings (CTOW)

	Above average	Average	Below average	Not evident
A1. Assessment included identification of relevant data				
A2. Data identified were organized and/or categorized				
A3. Reasoning was used to discover the meaning of the pieces				
A4. Relevant information was interrelated to find relationships				
S5. Information was assembled to construct hunches and/or generalization				
S6. The problems in the situation were identified				
E7. Data generated from analyses and syntheses were used to draw conclusions				
E8. Thoughtful questions were raised for further assessment				
E9. Evaluative criteria were made				
E10. Possibilities and appropriate solutions were identified				

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STUDENT APPROACHES TO STUDY AND USE OF ICT

Sources: Richardson, J. T. E. and Jelfs, A. (2015). Access and attitudes to digital technologies across the adult lifespan: Evidence from distance education. In L. D. Rosen, N. A. Cheever, and M. L. Carrier (Eds.), *The Wiley Handbook of Psychology, Technology, and Society* (pp. 89–103). Malden, MA: Wiley-Blackwell.

Jelfs, A. and Richardson, J. T. E. (2013). The use of digital technologies across the adult life span in distance education. *British Journal of Educational Technology*, *44*(2), 338–351. http://doi.org/10.1111/j.1467-8535.2012.01308.x (retrieved October 23, 2017).

Purpose: This scale is intended to be used to assess how students use digital technologies, particularly in the context of online learning. The studies conducted by Richardson and Jelfs focused on older adult learners as opposed to Net Generation or digital natives.

Description: The survey on student approaches to study and use of ICT includes several sections including demographics, questions about how confident the participant is about using various technologies and resources, questions about adaptive learning technologies, and an Approaches to Learning and Studying questionnaire.

Development and validation: The scale was based on ones described by Jones and Hosein (2010) and Jones et al. (2010), which were previously deemed valid and reliable. It also includes the Approaches to Learning and Studying questionnaire developed by Entwistle et al. (2003). The questionnaire included both online and paper versions and the authors describe differences between responses of those who took the survey in one version or the other in their article. The survey was deployed to over 4,000 students in stratified age groups from 20 to over 70 years of age to determine differences in technology among those groups. Factor analysis of the nine statements asking about student attitudes toward digital technology indicated that these statements could represent one scale.

Full text: Full text reprinted with permission of Richardson, J. T. E.

*

Open University survey on students' approaches to study and use of ICT

This survey forms part of our research into students' access to and use of different kinds of information and communication technologies (ICT) and approaches to study. ICT includes hardware such as desktop or laptop computers, mobile phones and other mobile devices, CDs and DVDs and digital music players. It also includes software and websites including online conferencing, social network sites etc.

Data Protection Information: The data you provide will be used for research and quality improvement purposes and the raw data will be seen and processed only by The Open University staff and its agents. This project is administered under the OU's general data protection policy guidelines.

Please use a ball point pen to complete the questionnaire. Do not use fountain or felt pens as the ink may be visible on the other side of the page. The questionnaire will be read with the help of a scanner so please fill it in as described. Please put an 'X' in the appropriate box keeping within the boundary of the box. Do not spend too long on each item. If you make a mistake and cross the wrong box, please block out your answer and then cross the correct box.
For example: ■ ☒ ☐ ☐ ☐

---

1. What is your occupation?
(If you have more than one occupation, please select your main one)

- ☐ Full-time student
- ☐ Part-time employee
- ☐ Full-time employee
- ☐ Unemployed and seeking employment
- ☐ Unemployed and not seeking employment
- ☐ Full-time carer
- ☐ Retired

---

2. Which is your age group?
(Please select one only)

Under 30	30–39	40–49	50–59	60–69	70 or over
☐	☐	☐	☐	☐	☐

---

3. Do you have access to the following for study purposes?
(Please select all that apply)

- ☐ Desktop computer
- ☐ Laptop computer
- ☐ Personal Digital Assistant (PDA) or palm-size computer
- ☐ Mobile phone
- ☐ Portable digital music player, e.g. MP3 player (not mobile phone)
- ☐ USB memory stick or similar method of transferring files

Continued

☐ Handheld games player
☐ Console games player

4a. Do you have access to the Internet?
(Please select one only)

Yes ☐

No ☐ If 'No' please go to Question 6

4b. Where do you mainly have access to the Internet?
(Please select all that apply)

☐ Home
☐ Library or other public facility
☐ Work
☐ Internet cafe
☐ Home of friend or family
☐ Anywhere (e.g. via mobile phone or other portable device)

5. If you have access to the Internet at your home or someone else's home, do you use:
(Please select one only)

☐ A dial up connection?
☐ Broadband or other constant connection?

6 If you use a mobile phone which features do you use regularly?
(Please select all that apply)

☐ Make/receive calls
☐ Make/receive text messages
☐ Camera
☐ Music player
☐ Internet access via phone network
☐ WiFi

7. How confident do you feel about using the following?
(Please select one for each row)

	Never used	Very confident	Fairly confident	Not really confident	Not at all confident
Word processing	☐	☐	☐	☐	☐
Email	☐	☐	☐	☐	☐
Spreadsheets	☐	☐	☐	☐	☐
Using Web searching tools, e.g. Google	☐	☐	☐	☐	☐
Using the Internet for shopping	☐	☐	☐	☐	☐
Using the Internet for studying	☐	☐	☐	☐	☐

	Never used	Very confident	Fairly confident	Not really confident	Not at all confident
Using the Internet for online communication, e.g. Skype	☐	☐	☐	☐	☐
Social networks, e.g. Facebook, Twitter	☐	☐	☐	☐	☐
Sharing with others, e.g. photographs on Flickr	☐	☐	☐	☐	☐
Wikis such as Wikipedia	☐	☐	☐	☐	☐
OU wikis that are part of your studies	☐	☐	☐	☐	☐
Personal blog that you maintain	☐	☐	☐	☐	☐
OU blog that is part of your studies	☐	☐	☐	☐	☐

8. Do you use any of the following to support you in your studies?
(Please select all that apply)

- ☐ Text reading software for dyslexic people, e.g. BrowseAloud, Read&Write, ClaroRead
- ☐ Screenreading software for visually impaired people, e.g. JAWS
- ☐ Screen magnification software, e.g. ZoomText
- ☐ Speech recognition software, e.g. Dragon
- ☐ Alternative keyboard or mouse
- ☐ Digital Talking books or Readout
- ☐ Comb bound versions of course materials
- ☐ Other support – please state: _____

9. How much time do you spend using ICT for study in an average week? Please include your use of desktop or laptop computer, mobile device, standalone DVD or CD player, software and websites.
(Please select one only)

None	Up to 30 mins	About 60 mins	1–3 hours	4–6 hours	7–10 hours	Over 10 hours
☐	☐	☐	☐	☐	☐	☐

10. How much time do you spend using ICT for other purposes in an average week?
(Please select one only)

None	Up to 30 mins	About 60 mins	1–3 hours	4–6 hours	7–10 hours	Over 10 hours
☐	☐	☐	☐	☐	☐	☐

Continued

11. To what extent do you agree or disagree with the following statements?
(Please select one for each row)

	Totally agree	Somewhat agree	Not sure	Somewhat disagree	Totally disagree
I have access to all the ICT necessary to study with the OU	☐	☐	☐	☐	☐
I am not clear about how the use of ICT can improve my learning	☐	☐	☐	☐	☐
I enjoy using ICT in my studies	☐	☐	☐	☐	☐
I think the importance of using ICT in education is overstated	☐	☐	☐	☐	☐
I am excited by the use of ICT at the OU	☐	☐	☐	☐	☐
I am reluctant to use ICT in my OU studies	☐	☐	☐	☐	☐
I work online in groups with other students at the OU	☐	☐	☐	☐	☐
I have been able to learn new ICT skills through my OU courses	☐	☐	☐	☐	☐
I have found it easy to contact my OU tutor using ICT	☐	☐	☐	☐	☐

12. In this section we are interested in how you learn and your approaches to study.
To what extent do you agree or disagree with the following statements?
(Please select one for each row)

	Totally agree	Somewhat agree	Not sure	Somewhat disagree	Totally disagree
I often have trouble making sense of the things I have to remember	☐	☐	☐	☐	☐
I go over the work I've done to check my reasoning and see that it all makes sense	☐	☐	☐	☐	☐
I usually set out to understand for myself the meaning of what we have to learn	☐	☐	☐	☐	☐
I generally put a lot of effort into my studying	☐	☐	☐	☐	☐
Much of what I learn seems no more than lots of unrelated bits and pieces in my mind	☐	☐	☐	☐	☐
In making sense of new ideas, I often relate them to practical or real life contexts	☐	☐	☐	☐	☐

	Totally agree	Somewhat agree	Not sure	Somewhat disagree	Totally disagree
On the whole, I am quite systematic and organised in my studying	☐	☐	☐	☐	☐
Ideas I come across in my academic reading often set me off on long chains of thought	☐	☐	☐	☐	☐
I look at evidence carefully to reach my own conclusion about what I'm studying	☐	☐	☐	☐	☐
When I communicate ideas, I think over how well I've got my points across	☐	☐	☐	☐	☐
It's important to me to follow the argument, or to see the reasons behind things	☐	☐	☐	☐	☐
I tend to take what we are taught at face value without questioning it	☐	☐	☐	☐	☐
I try to find better ways of tracking down relevant information in this subject	☐	☐	☐	☐	☐
Concentration is not usually a problem for me, unless I am really tired	☐	☐	☐	☐	☐
I organise my study time carefully to make the best use of it	☐	☐	☐	☐	☐
In reading for my courses, I try to find out for myself exactly what the author means	☐	☐	☐	☐	☐
I just go through the motions of studying without seeing where I'm going	☐	☐	☐	☐	☐
If I don't understand things well enough when I'm studying, I try a different approach	☐	☐	☐	☐	☐

13. Do you have any other comments you would like to add about using ICT?

_____

_____

_____

14. Would you be willing to take part in further research following on from this survey, e.g. telephone or email interviews? If so, please provide your contact details.

Name: _____

Email: _____

Telephone: _____

Thank you very much for your time spent filling out this survey. Please return the questionnaire as soon as possible using the pre-paid envelope (To: The Survey Office, Institute of Educational Technology, The Open University, FREEPOST, ANG 5175, Milton Keynes, MK76YR)

EGAMEFLOW

Source: Fu, F.-L., Su, R.-C., and Yu, S.-C. (2009). EGameFlow: A scale to measure learners' enjoyment of e-learning games. *Computers & Education*, *52*(1), 101–112.

Purpose: This scale measures the enjoyment a user experiences while playing e-learning games. A user's enjoyment impacts whether they are motivated to engage in and continue the game, and therefore continuing the learning experience. Very little research presents any evaluation of e-learning games.

Description: The EGameFlow measure consists of 42 items on nine subscales. Participants rate their agreement with items on a scale of 1 to 7. Respondents are also asked to rate their overall enjoyment with the game they are playing on set of criteria, on a scale of 0 to 100.

Development and validation: The scale was developed using an eight-step process. The development of the items was based on a framework by Sweetser and Wyeth's (2005) GameFlow checklist. The scale includes eight dimensions: concentration (games should require a player's concentration but minimize cognitive load), clear goals, feedback, challenge, autonomy, immersion, social interaction, and knowledge improvement. After the initial draft of the scale was composed, a panel of experts reviewed the items and made recommendations with respect to revisions.

Fifty-two students in an online software development course participated in the pre-test stage of the study. The authors used four games developed for the course in the study. Participants selected one game that they had played as a basis for their answers to the survey. To further validate the instrument, 166 students in six other courses answered the survey.

To determine whether items should remain on the scale, means and standard deviations were computed for each item. Most items were within 1.5 points of the mean. All items had a high discriminative power with a value greater than 0.7. Extreme groups comparisons were also computed by comparing 27 percent of the scores at the top and the bottom of the score range. The homogeneity test revealed that five items had loadings less than 0.3, resulting in only one item being removed.

Structure validity was determined through a factor analysis. KMO and Bartlett's test revealed values indicating that FA was an appropriate next step. Principal factor analysis was employed. Although all items loaded

above 0.40, not all items loaded on the expected dimension; therefore items were removed or recategorized. Another FA was conducted on the remaining 42 items, with nine factors. The factor "autonomy" was divided into two factors: autonomy and self-initiation. The revised scale accounted for 74.29 percent of the variance on scores. The scores on the scale were then correlated, with the item asking respondents to rate their overall enjoyment of a game on a scale of 0 to 100. The Pearson's product moment was a significant value of 0.54, indicating that the better the experience with the game, the higher participants rated their enjoyment of it. Correlations between each of the subscales and the overall score on the scale were above 0.50 and were significant at the 0.001 level, indicating convergent validity. Correlations between five of the subscales with other subscales were not significant and therefore supported divergent validity.

With respect to reliability, the entire scale demonstrated a CA of 0.94. Individual subscales had a CA above 0.80.

Full text access: All 56 original items appear on a table within the text of the source. Items that were deleted after the FA are marked.

*

STUDENT ONLINE MISBEHAVIORS (SOM) SCALE

Source: Li, L., and Titsworth, S. (2015). Student misbehaviors in online classrooms: Scale development and validation. *American Journal of Distance Education*, *29*(1), 41–55. http://doi.org/10.1080/08923647.2015.994360 (retrieved 23 October 2017).

Purpose: Particular types of learners perform better in online courses than others. For example, mature and independent learners achieve at higher levels. Additionally, certain behaviors are predictive of success as well. Research on misbehaviors in traditional classrooms has been well documented, but broad access to the internet has increased and changed the types of misbehaviors students commit in their courses, particularly online. This scale allows instructors and researchers to determine the types and level of misbehaviors in online courses and to potentially design interventions to improve student behaviors that are disruptive and inappropriate in order to improve student learning.

Description: The SOM scale is a 15-item instrument on four factors. The four factors include: seeking unallowed assistance (seeking inappropriate help for their work), internet slacking (behaviors that describe the ways students use the internet to do less work), aggressiveness (items that referred to aggressive communications with students and professors), and lack of communication (items that described students' lack of communication with their teachers or classmates).

Development and validation: Li and Titsworth (2015) developed the SOM scale through two studies. The first study included 13 instructors and 110 students. Participants were asked to fill out a survey that included demographic information and open-ended questions that asked respondents to describe student misbehaviors that they had seen in online courses. The researchers used the constant comparative method to identify 20 student misbehaviors. Face validity was affirmed by matching participant wording of misbehaviors to "conceptual definitions" (p. 43). To assure content validity, two laypersons coded each example of a misbehavior with the definitions provided by the researchers.

After the development of the initial scale, a survey was sent to instructors via a ListSERV inviting them to administer the instrument to their students. A total of 418 students ultimately participated. To determine the factorability of the SOM scale the researchers conducted

four assessments of the data. First, a correlation analysis was conducted, then Principal Axis Factoring with a Promax rotation was applied. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy indicated that factoring was appropriate. These analyses resulted in the removal of four items. A parallel analysis and scree plot indicated a four-factor model. The researchers set the loading cut off at 0.60/0.40, thereby retaining items that loaded close to 0.60, but not over 0.40 for a secondary loading. Using these criteria as well as ensuring that each factor had at least three items resulted in 15-item instrument.

In a second analysis, the researcher employed confirmatory factor analysis (CFA) to test the model fit of the four-factor structure. The researchers used five indices to determine model fit: chi-square, the root mean square error of approximation (RMSEA), comparative fit index, non-normal fit index, and the standard root mean square residual. These analyses revealed an acceptable fit for the four-factor model in that all items loaded significantly on the appropriate factors.

Participants also completed the Revised Cognitive Learning Indicators Scale (Frymier & Houser, 1999) and the Affective Learning Scale (McCroskey, 1994) to determine how student learning is related to student misbehaviors. The results of these analyses reveal that behaviors can be categorized as either passive or active. For example, aggressiveness is active while lack of communication is passive. Additionally, some misbehaviors are invisible (seeking unallowed assistance) while others are more overt (aggressive). The scale's overall reliability was Cronbach's Alpha (CA) of 0.93.

Full text access: Full text of the SOM appears below.

*

SOM

Part I. Please indicate the **frequency** and **severity** of each student misbehavior according to your experience. **Frequency** means how often you see students perform such behaviors; and **severity** means how severe the behavior is based on its consequence(s) on student learning. If you don't think some behavior type applies to your online class, please choose "Does not apply."

_____

_____

_____

1. Bad non-textual manners

Inappropriate use of non-textual manners such as using capitalizing or boldfacing; Smoking when face to face on the Skype; Inappropriate posters in the background when video blogging.

_____

_____

_____

2. Being aggressive towards the teacher

Being argumentative toward / hostilely communicating with the teacher on discussion boards or via email. For example, demanding credit for late work, despite the teacher's policy against it; Making grade threats: "You MUST give me at least a B or I won't be able to start my new job" via email; Accusing the instructor/TA for unfair grading; Snarky references to the assignment on blogs; Gripes about the teacher sent to all students in classes.

_____

_____

_____

3. Being aggressive towards classmates

Becoming offended easily by opposing ideas; Attacking (negative feedback, insulting, bad mouthing, cursing, rudely criticizing) other students' thoughts or group members' comments on discussion boards, in blogs, or online classroom chat.

_____

_____

_____

4. Lack of communication with teachers

Rarely initiating communication with the teacher; Rarely responding to teacher initiated communication; Asking the teacher fewer or no questions; Not clarifying teachers' instruction; responding slowly to email inquiries.

5. Lack of communication with classmates

Rarely initiating communication with classmates; Rarely responding to classmates' initiated communication; Failure to email classmates, or to clarify classmates' posts on discussion board; Responding slowly to email inquiries.

6. No communication with teacher or classmates

There is no communication from the student. Students often disappear! They fall off the face of the earth and the teacher and other students never hear from them again regardless of how many times/channels the teacher and other students try to contact them. Never check email. Not responding to emails. Not logging on to the online class for days, even though it has daily assignments.

7. Being inattentive

Ignoring/carelessness in reading instructions; Forgetting deadline / exams.

8. Lack of critical thinking

Only trying to fill out some information instead of reading and discussion of what is their own opinion and why; Poor discussion board comments; Submitting very short responses; Posts containing very little relevant information; Just focusing on the exam not the knowledge.

_____

_____

_____

9. Procrastination

Late submissions, postings, assignments.

_____

_____

_____

10. Slacking over group work

Being uninvolved when assigned to partner/group work via Blackboard; Not doing their part in a group activity; Reliance on group members to complete work, not cooperating/contributing.

_____

_____

_____

11. Slacking over individual work

Failure of doing the reading, notes, review of the lectures. In terms of course work: not following guidelines (short responses/incomplete assignments, never submit any work); Not participating in required postings in discussion boards.

_____

_____

_____

12. Cheating individually

Cheating in exam, by checking related book.

_____

_____

_____

13. Unallowed collaboration

Working together during the essay portion/exams/tests/quizzes; Sharing work/File exchange.

_____

_____

_____

14. Plagiarism

Googling during tests/quizzes, copying from internet, or having other people do it.

_____

_____

_____

15. Abusing technology

Taking advantage of technology features of online classroom to gain unallowed personal benefits; Making use of different testing time to get the test questions; Blaming technology for failure of communication, assignment completion or submissions.

_____

_____

_____

If there is any other student misbehavior that you have seen in your class that is not listed in the survey, please record them here.

_____

_____

_____

Reprinted with permission. Li, L., and Titsworth, S. (2015).

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CHAPTER 5

Student Achievement, Retention, and Attrition

DISTANCE EDUCATION STUDENT PROGRESS (DESP) INVENTORY

Sources: Thompson, E. (1999). Can the Distance Education Student Progress (DESP) inventory be used as a tool to predict attrition in distance education? *Higher Education Research & Development, 18*(1), 77–84.

Kember, D., Lai, T., Murphy, D. Siaw, I., and Yuen, K. S. (1994). Student progress in distance education courses: A replication study. *Adult Education Quarterly, 45*(1), 286–301.

Purpose: The DESP is useful for predicting which students will continue or withdraw from a distance education course. This scale can be used to either screen for students who may not continue or to improve retention by improving supports available to students.

Description: The DESP is a 72-item inventory comprising 17 subscales that fall on five factors: external attribution, emotional support, academic accommodation (two), and academic incompatibility.

Development and validation: Although Thompson's (1999) analysis was conducted nearly 20 years ago, her results confirm the validity of the Kember et al.'s results. Analysis of the items, as well, indicates that their phrasing and content focus on external factors related to the student's success, such as familial support, and internal factors such as motivation and study skills, rather than the technology used in DL itself.

Thompson analyzed 258 surveys completed by fourth-year undergraduate students in Australia. PCA was conducted on the 72 items which produced 15 factors with eigenvalues greater than 1, although only five factors were demonstrable when a scree plot was analyzed. Several models were tested all ranging with a variance of 35.8 to 66 percent of the variance. Thompson utilized Kember's original model of analysis using 15 factors. Discriminant analyses revealed that the model correctly classified 67.5 percent of the students who either withdrew from the DL class or continued.

Full text: Full text of items appear in Kember et al. 1994.

*

DOCTORAL STUDENT CONNECTEDNESS SCALE

Source: Terrell, S. R., Snyder, M. M., and Dringus, L. P. (2009). The development, validation, and application of the Doctoral Student Connectedness Scale. *Internet and Higher Education*, *12*(2), 112–116.

Purpose: More than 40 percent of doctoral students do not graduate and that number is larger for students in distance education programs. The Doctoral Student Connectedness Scale (DSCS) was developed to help program directors identify students at risk of dropping out, particularly those students in DL programs. Data from the use of this scale can assist directors and instructors in redesigning or creating supports in the learning environment to better strengthen the relationships between students and faculty.

Description: The DSCS is an 18-item scale representing two factors: faculty to student connectedness and student-to-student connectedness. Items are rated by participants on a scale of 1 (strongly disagree) to 5 (strongly agree). Examples of items include "I feel that students currently working on their dissertation care about each other," and "I feel that the feedback I receive from the faculty is valuable" (pp. 115–116).

Development and validation: The initial version developed by Terrell et al. (2007, 2008) was composed with 24 items intended to assess a sense of community and research competency among doctoral students. Items were adapted from Rovai's (2002) Classroom Community scale by the authors to be relevant to the work doctoral students do at the dissertation stage. To assure content and face validity, the scale was reviewed by a panel of experts which resulted in several items being removed, added, or amended. After the final version was complete, the authors sent the survey to 469 students in the doctoral program; 223 students responded to the survey. To assess construct validity and reliability the authors employed a PCA with oblique rotation. The KMO revealed a value of 0.920 and the Bartlett's Test of Sphericity was significant at the 0.000 value. These values indicated the validity of the sample size and the appropriateness of using factor analysis on the data. The internal reliability of the scale demonstrated a CA of 0.873 and a Spearman-Brown coefficient of 0.932. Factor analysis revealed a two-factor model that supported the structure of the two subscales: faculty to student connectedness and student-to-student connectedness. Items loading on each factor at or above 0.60 were retained. The entire model accounted for 64.04 percent of the variance.

Full text access: Full text of the DSCS appears in the appendix of the source.

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IDENTIFYING AT-RISK STUDENTS

Sources: Osborn, V. and Turner, P. (2002). Identifying at-risk students in LIS distributed learning courses. *Journal for Education for Library and Information Sciences, 43*(3), 205–213.

Osborn, V. I. (2000). Identifying at-risk students: An assessment instrument for distributed learning courses in higher education. Doctor of Philosophy thesis, University of North Texas.

Purpose: This scale can be used to identify students at risk of dropping out or doing poorly in distributed learning courses (defined as some version of separation of the student and faculty by distance or time as in online or hybrid courses). As noted previously, drop-out rates are higher when there is a distance component to the course or program. Identification of these students can assist instructors in providing an intervention to the student, or signal the necessity of course, program, or technology redesign.

Description: The scale includes several demographic type questions, and 26 items covering eight subscales, which include computer confidence, enrollment encouragement, locus of control, motivation, need for support, preparation for the course, study habits, and tenacity. Respondents score items on a Likert scale from strongly disagree to strongly agree.

Development and validation: Osborne selected items for inclusion on the scale based on a review of research on student attrition and distributed learning. The items covered nine subscales. Three evaluators reviewed the scale to assure content validity by matching items to the key variables for identifying at-risk students. Because of this assessment, one subscale titled "financial stability" was dropped from the instrument, leaving 28 items. Osborn and Turner (2002) tested the instrument on 240 students in an LIS distributed learning program. An EFA employing PCA was conducted and revealed that the extracted factors supported the subscales named above. The model accounted for 61.25 percent of the variance. This analysis resulted in a ninth factor which had items from two different subscales being dropped. A discriminant analysis was employed to assure predictive validity by demonstrating that course completion was correlated with responses on the scale. In other words, each of the 15 predictor variables distinguished between students who completed the course and those who did not. Internal consistency reliability for the eight subscales ranged from a CA of 0.457 to 0.789.

Full text access: Full text appears within the text of Osborn and Turner (2002) and Osborn's (2000) dissertation, where it can be found on p. 126. Retrieved October 24, 2017 from http://digital.library.unt.edu/ark:/67531/metadc2457/m2/1/high_res_d/Dissertation.pdf.

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INTERNAL LOCUS OF CONTROL AND RETENTION IN DISTANCE EDUCATION COURSES

Source: Lee, Y. and Choi, J. (2013). A structural equation model of predictors of online learning retention. *Internet & Higher Education*, *16,* 36–42. doi: 10.1016/j.iheduc.2012.01.005.

Purpose: This scale examines the impact of students' internal locus of control on student attrition in online programs.

Description: The survey measures students' perceptions of internal academic locus of control (ALOC), experience of the flow state, satisfaction with courses, the intention to persist, and the use of learning strategies. The scale includes 22 items measured on a five-point Likert scale from strongly disagree (1) to strongly agree (5).

Development and validation: The authors examined the literature on factors that impact student dropout rates in an online program. They focused on academic locus of control, use of learning strategies, flow experience, satisfaction, and student retention. Internal locus of control means that a person believes that his or her actions are responsible for events or outcomes. The instrument was developed using a variety of scales that measure the five factors indicated above (Bures, Abrami, & Amundsen, 2000; Levy, 2007; Shin, 2003; Shin, 2006; Somuncuoglu & Yildirim, 1999; Trice, 1985).

The instrument was administered to 282 students at an online university. Structural equation modeling and confirmatory factor analysis was used to analyze the data. CFA was used to evaluate the convergent and discriminant validity. Several measures were used to determine model fit. Chi square = 29.357, GFI = 0.972, AGFI = 0.938, TLI = 0.989, CFI = 0.992, and RMSEA = 0.029: all values fell within acceptable ranges. Reliability values for all factors ranged from CA 0.70 to 0.84.

Full text: Full text of each item is in a table within the text of the source.

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ONLINE LEARNING ACHIEVEMENT QUESTIONNAIRE

Source: Bernard, R. M., Brauer, A., Abrami, P. C., and Surkes, M. (2004). The development of a questionnaire for predicting online learning achievement. *Distance Education, 25*(1), 31–44.

Purpose: This questionnaire was developed to determine the relationship between online learning success and achievement.

Description: The questionnaire includes 38 items represented by four dimensions of readiness: confidence in online skills, self-management of learning, beliefs about distance education, and "desire for interaction with an instructor" or "peers" (p. 33). Items are rated on a four-point Likert scale from strongly agree to strongly disagree.

Development and validation: The development of the questionnaire began with a review of research on the following topics: study practices, learning styles, motivation, and instructional method preference. The questionnaire also included all thirteen items from McVay's (2001) Readiness for Online Learning Questionnaire (ROLQ).

The questionnaire was administered to 167 students. Demographic information as well as cumulative GPA and cumulative course grades were collected in order to determine the relationship between achievement and readiness to learn online.

Prior to factor analysis several indices of factorability were computed. Case by item ratio was 4.77, where 5 is considered appropriate. KMO was 0.70 and Bartlett's test was significant, indicating the FA could proceed. A four-factor model emerged which accounted for 48.88 percent of the variance. All items, except for two, loaded at or above 0.40. No items loaded on more than one factor. CAs for each factor ranged from 0.67 to 0.82. With respect to the research question, each factor was entered into a regression. Interaction with others had a negative relationship with course achievement, while self-direction and beliefs about distance education were positive predictors.

Full text: Full text of all items is available in Table 2 of the source.

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