A Systematic Review of the Use of the ESM Methodology in Education

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Introduction

This study is a systematic review of studies that used the experience sampling method to collect data in education settings.

The experience sampling method (ESM) is a longitudinal data collection method that involves gathering data frequently from participants over an extended period of time. The use of ESM in education research is on the rise in recent years because it provides a unique way to collect data closer in time to students' experiences that are of interest to researchers, and so this method provides a unique measure of ecological validity

Whereas some studies in education might involve, for example, collecting data from students 3-4 times over the course of a semester, an ESM study might involve collecting data from students 6 times a day for a week.

This is but one example of course, as there are infinitely many variations of ways that one could conduct an ESM study. The purpose of this systematic review is to review and code all of the studies in education that have used ESM, in order to aggregate data about their methodological choices and capture the typical ways that this methodology is used in education research.

Technology is used in various ways to conduct ESM studies. ESM relies on collecting data in the moment, and this often involves prompting participants to complete survey instruments at important times. These signals are done using many different kinds of devices, such as watches, beepers, smartphones running specialized ESM apps, etc. Surveying in ESM can also be done without an explicit signal from a signalling device. Many ESM studies use event contingent sampling, where participants are instructed to complete surveys at defined junctures in the day, such as at the end of a class period.

Literature Review

ESM was developed by Larson and Csikszentmihalyi (1983). ESM studies are also sometimes called "daily diary method" or "ecological momentary assessment" (EMA).

The book Experience Sampling Method by Hektner, Schmitdt and Csikszentmihalyi (2007) provides an overview of ESM variations.

The Present Study

The purpose of this systematic review is to provide a comprehensive cataloging of the ways that the ESM method has been used in education research studies.

Method

The literature search for this study was conducted over 2 databases, EBSCO and SCOPUS. We searched for all articles including the terms "ESM", "Experience Sampling Method", and XXX. The initial search from these databases returned XXX results, which we then screened to ensure that they were in the scope of this review, which was studies in education meeting XXX criteria. After screening the abstracts of the initial results, there were XXX articles deemed to be in the scope of the review.

A coding frame was developed to code the articles for the different methodological details of the study. The categories coded for included construct(s) studied, content area, age/level of target population, sample size, prompting method, number of signals, length of signaling period, response rate, signalling method, items used, number of items, validity and reliability information provided, missing data strategy, and type of analysis used.

Articles were coded by 3 researchers for each of the above categories. The coding frame was developed prior to the preliminary rounds of coding. Several preliminary rounds of coding were conducted to refine the coding frame and practice the coding procedure, and these codes were not included in the final data for analysis.

Sample

Coding

Construct

We wanted to find out what the extent that the research literature has covered as the them of study. The constructs have a variable of depth, some coding for the construct were singular and had a single focus. Other articles investigate several constructs and are broad in the scope that they cover. What is the focus of the study? There are many different types of constructs that researchers used ESM to investigate: **list**

Content Area

Determining what domains of knowledge researchers have used the ESM to investigate.

Age/Grade Level

ESM has been used across many grade levels and ages. Students from elementary grades, starting at grade _____ and all the way through middle, secondary, and post-secondary.

Role of participant

The main focus of participants were students, but there were others that included teachers or industry workers. ### Sample Size

Prompting Method

ESM has evolved in the methods that the participants are signaled when to fill out the surveys, questionnaires, or other documents. ### Number of Signals Signals effect the power of the study. It is said the more signals the better, this depends on what you are investigating and how long you have to run the study.

Length of Signaling Period (study length)

This is a determining factor for the

Response Rate

During the coding of the review papers this became something that we would continually look for in a paper. Many papers (n=) did not provide the reader with the response rate for their study.

Signal Method

How were participants informed when it was time for them to fill out the survey/questionnaires.

Items used

We also focused on the designs of the investigation, what type of question models they used. For example,

Discription of items

Number of Items

Validity and Reliability

focused on alpha

Missing Data Strategies

Types of Analysis

How did the researcher analysis the data. Authors used different terms for similar analysis.

Data Analysis

Strategies for Validating Findings and Establishing Reliability

Interrater reliability

Results

Each of the categories was coded for each of the studies listed, and the aggregates of these codes are shown below.

Discussion

The purpose of this systematic review was to document the methodological variation in ESM studies in education.

Overall we found some categories where there was significant commonalities across studies, e.g. XX% of studies were studying the constructs of X, Y, and Z. Almost all of the studies were with undergraduate students. XX% of studies used HLM models to analyze data of responses nested in persons.

There were some categories where there was significant variation.

Other categories revealed some interesting insights that defy easy categorization.

Discription of areas of interest (coding)

will work on further description and detail