INSIGHTS INTO PARENTAL LEARNING: EVALUATING A MOOC UTILIZING COURSE ANALYTICS AND FORUM CONTENT ANALYSIS

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Abstract

This study is based on a pilot run of a Massive Open Online Course (MOOC) developed specifically for parents with young children. The study analyzes participant activity and course analytics through various research questions focused on engagement metrics, course completion predictors, participant behavior patterns, the influence of demographic variables and personal motivations. Time spent in the course positively correlates with final scores. Background variables (like child's age group or participants' educational level) did not predict course completion. The categorization of participants into distinct engagement patterns — Disengaging Students, Active Participants, Speeders, and Partial Completers — provides insights into varying levels of commitment. Content analysis of forum discussions highlighted motivations for participation but showed no associations between motivation type and completion for example anxiety about parenting and course success. Overall, this study underscores the complexity of parental learning in an online environment. Based on these initial findings, future course designs could more effectively address learner motivations by integrating targeted questionnaires to capture participants' underlying goals and concerns.

Keywords: MOOC, parent education, learning analytics, forum content analysis, course evaluation

1. Introduction

A few years ago, a multidisciplinary team of early childhood education experts (including psychologists Mónika Serfőző, Zsófia Böddi, and Kinga Gyöngy, alongside pedagogues Anna Bereczkyné Záluszki and Zsuzsanna Hegedűsné Tóth) designed and facilitated a Massive Open Online Course (MOOC) targeted at parents of young children.

1.1 Need for parent support

Hungary is one of the European countries that grants long periods of well-paid childcare leave for parents (European Commission / EACEA / Eurydice, 2025). It is common for young children to be raised at home during their early years. Since 1967, mothers have been eligible to receive social security benefits and a modest financial allowance if they choose to raise their children under the age of three at home, regardless of prior employment. Additionally, paid parental leave has been available to working mothers since 1985, allowing them to remain at home with their infants while receiving at least partial pay until the child reaches the age of two.

Although staying at home with an infant is widely regarded as a typical aspect of childrearing, it is not without its challenges. Caring for a baby involves significant new responsibilities, and the unfamiliarity of the role can be demanding. In addition, parents may experience a shift in their social networks, often feeling isolated from previous social contacts. As a result, raising a newborn or toddler with limited social support can be perceived as a difficult and isolating experience for some parents. Consequently, a range of free and paid support services are available to assist new parents, although the quality of some of these resources is questionable (see for more Gyöngy 2021)

1.2 Need for parent support

Since the establishment of the university-level Bachelor's programme in Early Childhood Education and Care in 2010, a substantial body of professional knowledge has been developed within the field.

In parallel, expertise in the development of Massive Open Online Courses (MOOCs) has also became widely available. The initiation of MOOC development was made possible through the support of the university's department for teaching methodology.

The course was called "Survival Kit for Parents of Small Children" and the content was adapted from the Early Childhood Education and Care BA degree. It differed from courses designed for undergraduate students at least in two respects. It was designed for the public (general audience without previous knowledge) and for many participants (massive format). The course was structured around six modules: (1) an introduction to developmental psychology with a focus on observing one's own child, (2) the role of play in child development, (3) early literacy skills, (4) art and creative play with young children, (5) the importance of music in early childhood with activity ideas, and (6) attachment theory alongside practical guidance for the transition from home to nursery or kindergarten.

The course development started in 2018 prior to the widespread implementation of remote learning and working from home due to the COVID-19 pandemic, but was delivered in the fall of 2020 between two lockdowns, when online learning was technically the only practical option for individuals seeking to acquire new skills.

The format of the course was thought to be well-suited for parents with young children who presumably prefer the flexibility of an online course, particularly one with asynchronous learning opportunities, and value the significantly shorter training period compared to a typical university semester (6 weeks versus 12 weeks).

Facilitators perceived the course as successful. As a follow up, empirical evaluation was also conducted (Gyöngy & Tóth-Mózer, 2021). The present paper draws on data shared by participants in the course's introductory forum. Although the course was delivered in a fully online, asynchronous format—with no direct contact between facilitators and participants—the facilitators formed preliminary impressions about certain participant characteristics. Specifically, we observed frequent mentions of particular themes, which led us to hypothesize that these characteristics might be associated with higher levels of motivation or course completion. To test whether these impressions were supported by empirical evidence, a systematic content analysis was carried out, followed by statistical analysis comparing the identified patterns with actual course completion data.

2. Research Questions

RQ1: Is there a relationship between successful course completion and participants' reporting of time constraints?

It was hypothesized that participants who reported time constraints at the beginning of the course would be less likely to complete it. Since the course targeted parents of young children, it was uncertain whether they would have enough time to study. Some participants explicitly expressed this concern in their introductory forum post, prompting the question of whether such early self-reports could predict later non-completion.

RQ2: Can the behaviour of course participants be categorised into distinct patterns?

Is it possible to describe distinct patterns in the behaviour of course participants using course analytics in a manner similar to that previously reported in the literature (e.g. Khalil & Ebner, 2017)?

RQ3: Do parents appreciate the course's open online format?

Online parenting programmes have been shown to be particularly accessible for single parents and those with young children (see Gyöngy, 2021). In this study, we looked for contents relating to the open online format—specifically, whether they found this feature noteworthy or beneficial in relation to their own circumstances.

RQ4: Is there an association between participants' background variables and successful course completion?
Content analysis of the introductory forum posts allowed us to extract several background variables, including parental role (mother or father), number of children, age of the youngest child, level of education, whether the participant was living abroad, and whether they were currently enrolled in formal studies. We aimed to examine whether any of these variables were statistically associated with successful completion or failing of the course.
RQ5: Do any of the motivations expressed by participants in the introductory forum predict successful course completion?
Although the course explicitly stated that it could not offer individualized counselling, some participants nevertheless expressed personal motivations—such as seeking answers to specific childrearing questions or hoping to acquire skills to improve challenging situations in rearing toddlers. This raised the question of whether certain types of initial motivation were associated with greater engagement and a higher likelihood of completing the course.

3. Methods

3.1. Details about the pilot

The course was designed and delivered via Canvas MOOC interface. We did not exclude anyone who was not able to keep up with the pace and all modules were published from day one.
In the introductory forum, participants were asked to respond to the following questions: Who are you? How many children do you have? How old are they? What do you hope to gain from this course? To model the expected tone and structure of the responses, the course instructors posted the first entries themselves. This allowed participants to see how we envisioned these introductions, setting a supportive and personal tone for the forum interaction. Facilitators replied to the student entries in the forum.

3.2. Data collection

Our aim was to gather as much information as possible about the course, in addition to the data that is more easily available from course analytics, without asking students to complete separate questionnaires.
On top of the completion status of the course (final score and course grading), some additional student course analytics were extracted from the Canvas interface: activity during the weeks of the course, number of assignments submitted, module completions (unstarted, in progress, finished).

After setting up the data table, we have identified multiple registrations and deleted inactive profile data.
The introductory forum provided the text corpus, which was exported from Canvas. It was imported into the content analysis software as focus group data because the forum posts, along with the facilitator responses, resembled a conversation
Finally, personal data that could identify students was deleted before data analysis commenced.

3.3. Data analysis

MAXQDA 2018 software was used to perform exploratory content analysis. Codes were assigned straightforwardly according to their meaning and were not mutually exclusive. Codes could be as short as one word or as long as several sentences.
Content analysis of the introductory forum yielded the following variables: mother/father, number of children, age of youngest child, level of education, living abroad, currently studying, motivation for taking the course, other information (the latter two to be discussed in results).

In line with the research questions, statistical analyses were carried out on the dataset using IBM SPSS Statistics 23.

4. Results

302 users registered in the course, half of them (N=154) failed to submit any assignments. Out of the participants who started the course (in terms of handing in any graded assignments; N=148), 44% met the requirements. 21 participants were rated as passing and 45 out of 66 achieved an excellent grade.
41% of participants (N = 124) commented in the introductory forum. The average length of the entries was 105 words.

- **RQ1: Is there a relationship between successful course completion and the reporting of time constraints?**

In the introductory forum time management emerged as a concern for 19 participants (15% of the introductory forum), with some expressing apprehension about balancing learning and assignments alongside the demands of raising young children. Additionally, some participants who joined the course late expressed anxiety about catching up with the advanced stage of the program.
There is no significant relationship between scheduling concern and performance, with almost the same proportions of performers and non-performers among the scheduling concern indicators as among the other course takers ($\chi^2(1, N=124) = 0.196$, $p = 0.658$).

- **RQ2: Can the behaviour of course participants be categorised into distinct patterns?**

To cluster the participants' behaviour into patterns, variables were required that provided information about activity over time relative to the course run, rather than reflecting overall activity. A variable was created that summed up the activity levels in the different weeks of the course. Additionally, ordinal variables were used to indicate the completion of the seven modules, with scoring that included unbegun unit, activities in progress, and activities completed.
Following the literature (e.g. Khalil & Ebner, 2017), an exploratory analysis was conducted using K-means cluster analysis. Initially four clusters were defined, then patterns were observed while experimenting with the number of clusters. Ultimately, the five-cluster version was chosen as it provided the most interpretable cluster memberships.

Two distinct patterns of activity emerged among those who did not complete the course. Some logged into the course interface presumably only once (N= 169) and may have clicked into a module but did not submit any assignments (‘Bystanders’ by Anderson et al, 2014; or ‘No-Shows’ according to Hill, 2013). Fifty participants, referred to as 'Disengaging Students' (by Kizilcec et al., 2013), returned to the course for two to three weeks, some submitted the first four assignments, but did not continue afterwards (N=50). Fifty-four students completed all the modules and were active for the whole course, including the preparation and closing periods (9 weeks in total), and all of them met the final assessment criteria. We could refer to them as Active Participants (see also Hill, 2013).

Additionally, a group of fifteen students completed all modules despite only being active for half of the course (4.4 weeks). Among this group, more students passed (11) than failed (4). It seems that this group could complete the course at a faster and self-paced schedule than required. However, due to time constraints, there was a risk that they would not meet the grading criteria despite handing in the assignments. This type of behaviour has not been reported in the literature, we could call them ‘Speeders’.
Finally, there was a group of participants (N=13) who logged back to the course through its running time (7.5 weeks), but only partially completed the modules. Initially, they submitted all the assignments, but eventually only one outlier remained who continued handing in coursework and managed to get a passing grade. It is likely that the incomplete modules resulted from two different types of behaviour: one that focussed only on assignments (’Solvers’ according to Anderson et al., 2014, who submit assignments but view few lecture videos) and the other that consisted only in viewing course content (’Viewers’: who watch lectures and submit few assignments according to the clustering method of Anderson et al. 2014).

- **RQ3: Do parents appreciate the course's open online format?**

The content analysis indicated that only a few respondents were interested in the specifics of massive open online courses (MOOCs). Specifically, three participants were intrigued by the online course format and the application of digital teaching-learning methods, rather than solely the course content. In addition, accessibility was a positive aspect that six respondents highlighted. They appreciated the fact that the course was open so that it could be taken by people outside the university, as well as the online format which made it accessible to them.

Thirteen respondents (10.5%) appreciated that the course content and tasks were created by experts, so that they did not have to navigate through the vast amount of knowledge available on the internet.

11 participants (9%) expected to learn from their peers, share experiences, or mentioned that they appreciated re-entering the 'adult world'.

Lastly, a considerable number of participants, almost one in five (18%), expressed gratitude for the opportunity to participate in the course.

- **RQ4: Is there any association between the participants' background variables and the successful completion of the course?**

The community of learners was predominantly female (93%). The designers aimed to include fathers as well, but only 4.5% of those who completed the course were men. Additionally, 7 participants were found to be living abroad.

Parental status. Out of the respondents, 124 answered the question regarding their parental status. Among them, 110 were parents, while 14 were not. Excluding those who were expecting, the participants mentioned a total of 148 children in the introductory forum. Specifically, 71 parents had one child, 27 had two, 6 had three, and one had five. Since the course was intended for parents of children under three years old, the age of the youngest child was also relevant. 106 participants had children under three.

Although parents outnumbered childless participants, there were enough of the latter to run a chi-square test. Having a child did not make a significant difference to course completion ($\chi^2(1) = 0.00$, $p = 0.993$), childless participants completed the course at a similar rate to parents.

We investigated whether there was a correlation between dropout rates and the age of the youngest child of the course participant. No relationship was found when examining the age ranges of children, including the first six months, second six months, second year of age, and third year of age. There was also no statistical correlation indicating that parents with a child older than 2 years had a higher drop-out rate ($\chi^2(1) = 3.165$, $p = 0.908$).

Previous education. Upon reading the introductions of the participants, it was apparent that a significant number of them held degrees. Some even had multiple degrees or were currently pursuing a doctoral degree. From the content analysis of the introduction forum (N=124), it was found that 23 participants did not mention their educational background. Nine participants had secondary education, of whom five were university students. The remaining 92 participants had university degrees.

When asked 'Who are you?', most respondents provided their field of expertise and level of education. Only 28 out of 124 did not provide additional information about themselves. Of the remaining respondents, 68 mentioned formal training or informal self-education in the field of early childhood education. Formal training related to early childhood and developmental psychology included pre-school teacher training, early childhood educator training, special needs teacher training, home visitor training and teacher training. Non-formal learning involved reading parenting books, listening to lectures, following Facebook communities, forums and blogs.

Among the students, there were many graduates, but having a degree did not guarantee completion. Of the 92 participants with a higher education degree, 53 passed (58%), while 7 out of 9 with a secondary education degree passed (77.8%). The difference between the groups was not statistically significant (Fisher’s exact test =.305, $p = .209$, N=101).

- **RQ5: Do any of the motivations expressed by participants in the introductory forum predict successful completion of the course?**

Anxiety and being first-time parents. The introductory forum entries were coded for attitudes towards the children. 22 participants, i.e. 18%, had a positive attitude towards their child. They described that spending time with them brought happiness, fulfilment and joy to their lives. In some cases, parents used adjectives to describe their child, suggesting that they associate a value or a positive meaning with their child (miracle, "fruit of our love", sweet, expected, adorable, "the apple of our eyes", etc.). On the other hand, some content expressed self-doubt, fears, and anxiety related to having children (13 people, or 10.5%).
Among the respondents, 17 emphasized that they joined the course due to being first-time parents (i.e. inexperienced). The participants of the course included four expectant mothers, 68 parents of one child, and three parents of one child who were expecting their second child. All expectant mothers with their first child referred to their first-time parent status, while only 13 out of the 68 parents of one child emphasized that they were raising their first child. The respondents who emphasized being first-time parents are not the same as those mentioned in the previous paragraph who expressed concerns about having children. Fourteen respondents mentioned only being first-time parents, while ten mentioned only anxiety. Only three of them mentioned both anxiety and being first-time parents.
No association was found between course completion and the display of content indicating self-doubt ($\chi^2(1) = 2.942$, $p = 0.86$, N=124).

Similarly, no relationship was found between the emphasis on having a first child and completion. The proportion of completers and non-completers among the inexperienced was similar to that of the other course participants ($\chi^2(1) = 1.149$, $p = 0.284$ N=124).
Learning motivation. All 124 participants, with one exception, responded to the question of what they would like to learn or develop by providing more specific information. The expectations can be broadly divided into two categories: self-development and learning in general, and development in relation to the child.

Content was classified as self-development if someone expressed curiosity or a desire to learn, or if they viewed the course as part of lifelong learning. Some respondents indicated a desire to use what they learned in the course for professional purposes. The desire for personal (theoretical) development was mentioned by 37 respondents or 30%.
Respondents mentioned expectations for the use of learning in relation to their children in several content categories. The most prominent of these was the practical aspect. 61% of respondents (88 respondents) mentioned some kind of practical aspect to the course.

Among the practical expectations, there was a demand for a survival kit (among a total of 57 course participants). The interpretation of the term 'survival kit' varied among the participants.
For some respondents, the first part of the term 'survival' was more emphasized (27 mentions, 22% of the participants). They indicated some difficulty in child-rearing, mainly expressed by adjectives in relation to parenting (such as mentioning challenging situations, struggling during long winter days, daily life seen as a battle etc.).
For 35 participants (28% of the total), the second word of the term 'survival kit' was more pronounced. They wanted practical tools for everyday life. These included parenting advice, knowledge that could be easily integrated into daily routines, and concrete methods and practices.
50 participants, accounting for 40% of the sample, expressed their desire to aid their child's development by applying the knowledge acquired from the course. This could involve supporting development in general or utilising specific areas such as play, music, or children's literature. Respondents did not mention these categories in a mutually exclusive way, but in different combinations (see Figure1).

Figure 1. Co-occurence of content themes (diagram was drawn by Miklós Gyöngy using Matlab software)



5. Discussion

Although we did not initially used a structured questionnaire to collect detailed background information about our participants, the open-ended nature of the introductory forum prompted the emergence of several meaningful themes. These unsolicited disclosures offer valuable insight into participants' motivations, circumstances, and expectations, and may serve as a basis for developing more systematic, structured measures in future course runs.

A well-known limitation of open-ended questioning is that participants often omit relevant information, even when it is applicable to them. As a result, such data rarely yield frequencies high enough to support statistically significant associations between variables. Keeping this limitation in mind, the following section discusses the findings in relation to each of the research questions.

- **RQ1: Is there a relationship between successful course completion and the reporting of time constraints?**

There was no relation between reporting of time constraints and course competion success. When participants mention concerns about limited time for studying, this may reflect two distinct attitudes. On the one hand, it may indicate an actual lack of available time, which could increase the risk of non-completion. On the other hand, it may reflect an awareness of time constraints that leads to more intentional time management and sustained engagement. Thus, reporting time constraints in itself is not necessarily a risk factor for attrition; rather, its impact may depend on how participants respond to their perceived limitations.

- **RQ2: Can the behaviour of course participants be categorised into distinct patterns?**

A total of 302 participants registered for the first round of the course—a considerably smaller cohort than those typical of large-scale MOOC platforms. Despite this relatively modest sample size, we were able to identify engagement patterns similar to those reported in the literature on massive open online courses.

Of the registered participants, 55.9% were classified as "No-Shows", meaning they logged in once or briefly interacted with course content (e.g., clicking into a module) but did not return. This behaviour resembles someone picking up a book, scanning the table of contents, and then deciding not to continue. 16.5% were "Disengaging Students", who began the course and returned multiple times, completed initial assignments, but ultimately dropped out. This is the typical attrition pattern.

17.8% were "Active Participants" who consistently engaged with the course throughout its duration; all members of this group successfully completed the course. 5% were identified as "Speeders"—participants who engaged only during a portion of the course timeline. Some of these learners joined the course after its official start date, while others delayed engagement and then

attempted to complete the tasks in a compressed time frame. This behaviour may have emerged because the course design allowed late submission of assignments, meaning that students were not penalised for deviating from the intended pacing. Such flexibility might explain why this learner type has not been frequently reported in the literature.

A small proportion of participants (4%) were grouped as “Partial Completers”, although this category did not further subdivide into identifiable subtypes in our sample. With a larger sample size, more distinct patterns might have emerged. For instance, the “Solver” type—someone who skips course content and focuses only on completing quizzes—has been noted in university-based MOOCs, particularly among students fulfilling formal academic requirements. This pattern may be less relevant in voluntary, interest-driven courses such as ours. By contrast, the “Viewer” type—those who engage with course content without submitting assignments—appeared more frequently in our parent participant group and may represent a preference for low-commitment, exploratory learning.

- **RQ3: Do parents appreciate the course’s open online format?**

Several respondents valued the openness of the course, which allowed individuals beyond the university community to participate, as well as the flexibility offered by digital delivery. This aligns with previous research emphasizing the importance of accessible online formats, especially for parents with young children who may face time and mobility constraints.

The notable proportion of participants expressing gratitude for the opportunity to take part in the course must be understood in the context of the COVID-19 pandemic. The pandemic significantly increased public acceptance of online learning formats, as many in-person programs were suspended or cancelled. For families with young children, this shift also created a heightened need for social connection and support, as usual community activities and parent-child programs were no longer accessible. Given the unique circumstances of the COVID-19 pandemic during the pilot, it would be valuable to run the course again in a post-pandemic context to examine whether parents’ reception would be similar.

- **RQ4: Is there any association between the participants' background variables and the successful completion of the course?**

Parental circumstances. There was a concern that certain life situations, such as the developmental state and needs of babies or toddlers, might impede successful parental participation in a MOOC. However, no significant correlation was found between the child's age and completion rate.

At the same time, there is no information available to determine whether a MOOC would be an appropriate form of knowledge transfer for parents facing difficulties such as single-parent duties or parents with children who have difficult temperaments.

Previous education. The course was predominantly attended by individuals who had graduated from university, which indicates two things. On one hand, the MOOC offered by the university may have been attractive to individuals already familiar with university courses. On the other hand, it suggests that those with strong learning abilities were more likely to enroll. Half of the participants in the introductory forum mentioned prior formal training in child-rearing or informal self-training in parenting. This indicates that the topic was important to the participants and they were motivated enough to educate themselves on it.

The facilitators were under the impression that the course was completed by individuals with higher degrees due to the overrepresentation of university degree holders among the participants. However, this impression was not supported by the statistical test. The proportion of participants with A-levels was low, but their drop-out rate was similar to that of those with a university degree.

The presence of non-degree holders among the certificate earners indicates that the course's language and topics were well designed to be accessible to individuals without prior knowledge or previous study.

- **RQ5: Do any of the motivations expressed by participants in the introductory forum predict successful course completion?**

Two main themes emerged from participants' motivations. First, some expressed a sense of personal lack—such as low confidence as new parents or anxiety related to parenting. Second, others described their motivation as positive and growth-oriented, either through a commitment to lifelong learning or specific learning goals related to their children.
Expressions of anxiety or being a first-time parent were not associated with course completion; such concerns did not increase motivation to finish.
Anxiety and being first-time parents. Expressions of self-doubt and anxiety about raising children were not related to performance, nor was the emphasis on having a first child. In other words, fears or anxiety were not an additional motivation to complete the course.
Learning goals related to their children showed interesting co-occurrences, and we were pleased to illustrate how different participants emphasized various aspects (see Figure 1).
In summary, this exploratory investigation of the firs run of a MOOC targeted towards parents with small children was a quest to understand the learners'backgrounds and motivations.

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