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Research Insights
Изследователски проникновения

MEDIATED LEARNING EXPERIENCE (MLE) AND PARENTAL MEDIATION IN ADOLESCENT SMARTPHONE USE

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Abstract. This article examines the impact of adolescent smartphone use and the role of parental mediation in promoting healthy digital behaviors. Integrating Feuerstein's Mediated Learning Experience (MLE) theory, it highlights structured strategies – such as intentional guidance, self-regulation, and goal-setting – to enhance critical thinking and responsible smartphone use. The results indicate that higher implementation of Mediated Learning Experience (MLE) strategies – particularly Regulation, Feeling of Competence, and Meaning – is strongly associated with lower levels of problematic smartphone use among adolescents. Self-regulation and meaning-making components emerged as key predictors, explaining 38% of the variance and highlighting their central role in effective parental mediation.

Keywords: adolescent smartphone use; parental mediation; MLE, self-regulation; MPPUS-10

Introduction

The proliferation of digital media, particularly smartphones, has fundamentally transformed the landscape of childhood and adolescence in the 21st century. Today's adolescents, often referred to as "Generation Z" or the "Web 2.0 generation," are characterized by their "hyper-connectivity" to the Internet and digital networks (Dawson, Eltayeb, & Omar, 2016; Vorderer, Hefner, Reinecke, & Klimmt, 2017).

The digital media offers unprecedented opportunities for learning, communication, and it also creative expression, it also presents significant challenges for young users and their parents. Research (Panova & Carbonell, 2018; Kim, Min, & Co., 2018) consistently demonstrates that inappropriate or excessive smartphone use can lead to various negative outcomes, including academic difficulties, social isolation, behavioral addiction, and even problems with mental health.

Recent research identifies key symptoms of smartphone addiction such as excessive preoccupation, loss of control over use, and anxiety when separated from the device. Increased loneliness and social isolation are closely linked to a higher risk of smartphone addiction, significantly affecting personal relationships and social engagement. As technology continues to advance, the implications of these findings remain significant, highlighting an ongoing need for awareness and intervention strategies to combat smartphone addiction (Twenge et al., 2018).

Although, according to the most recent Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR)1), there is no official diagnosis for smartphone overuse or addiction, many researchers (such as Panova & Carbonell, 2018) increasingly recognize that problematic smartphone use represents a type of behavioral addiction that is highly related to other forms of digital media overuse, such as addiction to the Internet, online gaming, and social networking.

Problematic use typically includes engaging in excessive cellular communications, spending disproportionate amounts of time or money on smartphone activities, and using smartphones in socially or physically inappropriate situations, such as while driving. Increased problematic use often leads to negative effects on relationships and the development of anxiety when separated from the device, a condition known as "nomophobia" (no-mobile-phone phobia) (Pajo, 2021).

The cultural "disconnect" created by rapid technological advancement often leaves parents with feeling that they are unprepared to guide their children's digital experiences effectively. Many parents lack sufficient familiarity with the technologies their children easily master, creating environments where young people experience digital stimuli without adequate protection or mediation (Yardi & Bruckman, 2011; Livingstone et al., 2015).

The presence of smartphones in everyday life may negatively affect social interactions among teenagers. Recent studies demonstrate that smartphones not only reduce face-to-face social interactions between teens but also diminish the quality of communication with adults (Amanda, 2020). Some adolescents begin replacing face-to-face conversations with online interactions, potentially limiting their development of in-person social skills (Achterhof et al., 2022). These disruptions in social interactions highlight the importance of parental involvement, providing a foundation for parental mediation theory, which examines how parents use communication strategies to guide and regulate their children's media use.

Parental mediation theory posits that parents utilize different interpersonal communication strategies in their attempts to mediate and mitigate potential negative effects of media in their children's lives (Tang & Mahoney, 2019). The theory assumes that interpersonal interactions about media that occur between parents and children play a crucial role in socializing children into society and shaping their understanding of appropriate media use. The theory posits that parents utilize different interpersonal communication strategies in their attempts

to mediate and mitigate potential negative effects of media in their children's lives (Tang & Mahoney, 2019). The theory assumes that interpersonal interactions about media that occur between parents and children play a crucial role in socializing children into society and shaping their understanding of appropriate media use.

Although initially focused on media's negative effects, the theory now adopts a balanced perspective, recognizing that media outcomes depend on context and use.

From a socialization perspective, parental mediation serves as a mechanism through which parents transmit values, norms, and expectations regarding appropriate media use. This process helps children develop critical thinking skills about media content and learn to make informed decisions about their media consumption (James & Kur, 2020).

Research identifies three main classic parental mediation strategies: restrictive, permissive, and active (Hwang et al., 2017). Restrictive mediation limits media use through rules, monitoring, or parental controls but may provoke rebellion and has limited long-term effectiveness (Peraza-Balderrama et al., 2022; Chen & Shi, 2019). Restrictive mediation represents the most straightforward approach for parents to implement, as it relies primarily on external controls rather than requiring extensive knowledge of media content or sophisticated communication skills. However, research suggests that restrictive approaches may have limited long-term effectiveness and can sometimes produce unintended consequences (Geurts et al., 2024).

Permissive mediation allows minimal restrictions, which can increase problematic media use as children may interpret it as parental approval (Supriyono & Ishaq, 2023). Permissive mediation may be chosen by parents who feel overwhelmed by the complexity of digital media, lack confidence in their ability to provide guidance, or believe that unrestricted access helps children learn to self-regulate. However, research suggests that children benefit from appropriate guidance and structure in developing healthy media use patterns (Hazizah, 2019).

Active mediation – the most effective approach – involves discussing media content, risks, and appropriate use with children to promote critical thinking and self-regulation (Fu et al., 2020; Suárez-Álvarez et al., 2022). It includes negative (factual) mediation**,** focused on risks and prevention, and positive (evaluative) mediation**,** emphasizing safe, constructive use within a supportive parent-child relationship (Yang et al., 2022; Suárez-Álvarez et al., 2022).

Multiple studies have confirmed the superior effectiveness of active mediation compared to restrictive or permissive approaches. Fu, Liu, Liu, Ding, Hong, and Jiang (2020) found that active mediation significantly reduced problematic smartphone use among adolescents while also enhancing their digital literacy skills. Similarly, Collier, Coyne, Rasmussen, Hawkins, Padilla-Walker, Erickson, and Memmott-Elision (2016) demonstrated through meta-analysis that active mediation strategies produced the strongest positive outcomes across multiple

domains of adolescent development. The effectiveness of active mediation appears to stem from its educational approach, which helps adolescents develop internal self-regulation skills rather than relying solely on external controls. This internalization of healthy behaviors creates more sustainable patterns of appropriate smartphone use.

While active mediation has been identified as the most effective strategy for guiding children's media use, its practical implementation can be challenging. Feuerstein's Mediated Learning Experience (MLE) theory offers a structured framework to translate these principles into concrete, actionable guidance.

Reuven Feuerstein's Mediated Learning Experience theory represents a comprehensive framework for understanding how human mediation enhances cognitive development and learning capacity. This theory provides specific, practical guidance for implementing effective mediation strategies (Tzuriel, 2021). Feuerstein (1998) proposed that mediated learning represents one of the primary ways humans interact with their environment. While much learning occurs through direct exposure to stimuli, mediated learning experiences are what enable humans to benefit maximally from these direct experiences and to develop the capacity for change and adaptation.

According to Feuerstein (1988, 1991, 1998), mediated learning occurs when someone with knowledge and experience mediates between the learner and the environment, making experiences more understandable and meaningful. The mediator shares accumulated experience and helps the learner develop tools for understanding and responding to future situations.

He (1988, 1991, 1998) emphasized that mediated learning does not replace direct experience but rather enhances the individual's capacity to benefit from direct exposure to stimuli. The more a person experiences quality mediated learning, the greater their ability to learn from direct experiences and to adapt to new situations.

Conversely, insufficient mediated learning experiences can limit an individual's capacity to benefit from direct exposure to environmental stimuli, potentially leading to learning difficulties and reduced adaptability.

Components of Mediated Interaction

Feuerstein (1988, 1991, 1998) identified three primary components of effective mediated interaction:

1. Creating Order: Mediated interaction helps organize the learner's encounter with the environment, providing structure and coherence to experiences

2. Providing Tools: Mediation gives learners tools to observe phenomena, understand connections between them, and discover underlying principles

3. Uniquely Human Phenomenon: Mediated learning represents a distinctly human capacity that enables cultural transmission and individual development.

Causes of Inadequate Mediation

Feuerstein (1988, 1991, 1998) identified two categories of factors that can lead to inadequate mediated learning experiences: environmental factors - include lack of available mediators, poverty conditions that prioritize immediate survival over cultural transmission, societal emphasis on material rather than educational values, and cultural disruption that interferes with intergenerational knowledge transfer; and individual factors - include central nervous system problems, emotional difficulties, developmental delays, educational challenges, and other barriers that may interfere with the individual's ability to receive and process mediated experiences.

Importantly, Feuerstein (1988, 1991, 1998) maintained that effective mediation can overcome any barrier if the mediation is appropriately adapted to reach the individual recipient.

Feuerstein's MLE theory provides a structured framework for understanding how parents can effectively mediate their children's smartphone use. The theory suggests that effective smartphone mediation should:

1. Help children understand the connections between their smartphone use and broader life experiences.
2. Provide tools for self-regulation and decision-making about technology use.
3. Create meaningful learning opportunities around digital citizenship and healthy technology habits.
4. Adapt mediation strategies to individual children's needs and developmental levels.

Feuerstein (1988, 1991, 1998) identified twelve specific parameters of mediated interaction that characterize effective mediation. These parameters provide concrete guidance for implementing MLE principles in various contexts, including smartphone mediation. The first three parameters are considered essential for any mediated learning experience:

1. Intentionality and Reciprocity (IR) This parameter involves the mediator's clear intention to create a learning experience and the learner's recognition and acceptance of this intention. In smartphone mediation, this means parents explicitly communicate their educational goals and adolescents understand and engage with the learning process.
2. Meaning (ME) This parameter involves conveying the significance and importance of the learning experience beyond its immediate context. In smartphone mediation, meaning helps adolescents
3. Transcendence (T) This parameter involves connecting current experiences to broader contexts, past experiences, and future applications. Transcendence helps adolescents understand that smartphone mediation lessons apply beyond the immediate situation.

The remaining nine parameters provide additional depth and effectiveness to mediated learning experiences:

1. Feeling of Competence (FC) This parameter involves helping learners develop confidence in their abilities and recognize their successes. In smartphone mediation, this means acknowledging adolescents' progress in developing healthy use patterns and building their sense of self-efficacy.

2. Regulation and Control of Behavior (RP) This parameter focuses on developing self-monitoring and metacognitive skills. For smartphone mediation, this involves helping adolescents learn to observe their own use patterns, recognize triggers for problematic use, and develop strategies for self-regulation.

3. Interdependency and Sharing (IS) This parameter emphasizes collaborative learning and mutual support. In smartphone mediation, this involves creating opportunities for family members to share experiences and learn from each other about healthy technology use.

4. Individual Differentiation (IU) This parameter recognizes and supports individual differences in learning styles, interests, and needs. For smartphone mediation, this means adapting strategies to fit each adolescent's unique characteristics and circumstances.

5. Goal Setting and Achievement (GO) This parameter involves helping learners establish and work toward specific objectives. In smartphone mediation, this includes collaborative goal-setting around smartphone use patterns and celebrating progress toward these goals.

6. Challenge and Novelty (NC) This parameter encourages engagement with new and complex situations. For smartphone mediation, this involves gradually increasing expectations and helping adolescents handle more complex digital situations independently.

7. Optimistic Alternatives (OA) This parameter focuses on creative problem-solving and maintaining hope for positive outcomes. In smartphone mediation, this involves helping adolescents find constructive alternatives to problematic smartphone use patterns.

8. Awareness of Change (CA) This parameter involves recognizing and celebrating growth and development. For smartphone mediation, this means helping adolescents recognize their progress in developing healthier smartphone use patterns.

9. Sense of Belonging (FB) This parameter connects individuals to broader cultural and community contexts. In smartphone mediation, this involves helping adolescents understand how their technology use connects them to family values and community expectations.

These parameters provide a comprehensive framework for structuring smartphone mediation conversations and activities. Rather than requiring implementation of all parameters in every interaction, parents can select and emphasize parameters that are most relevant to specific situations and their child's developmental needs.

The parameters offer concrete strategies for moving beyond simple rule-setting or restriction to create meaningful learning experiences that enhance adolescents' capacity for self-regulation and healthy decision-making about smartphone use.

This comprehensive literature review establishes the theoretical foundation for understanding the relationship between Mediated Learning Experience (MLE) and smartphone use among adolescents.

The integration of smartphone use research with MLE theory represents a novel approach that addresses current gaps in both fields. This integration has the potential to provide practical, theoretically grounded strategies for parents and educators while contributing to theoretical understanding of effective mediation processes. While the theoretical foundation supports the application of MLE principles to smartphone mediation, empirical research is needed to validate this approach and identify which specific parameters are most effective in reducing problematic smartphone use among adolescents.

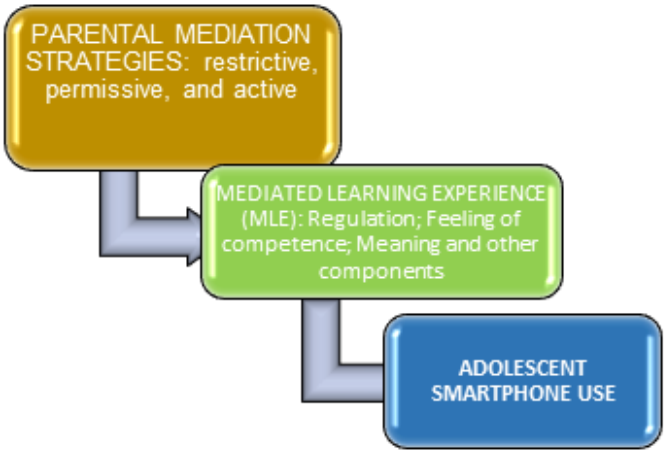


Figure 1. Conceptual model of the studied constructs

Research Methodology

This study employs a quantitative research design utilizing survey methodology to collect data from both adolescents and parents. Each adolescent participant's parent or guardian was also invited to complete a corresponding parent questionnaire, resulting in matched parent–child dyads.

Data Collection Procedure

Data collection occurred in two waves: Wave 1 (July 2023) collected independent responses from adolescents and parents without family matching, while Wave 2 (July 2024) specifically recruited complete family dyads to enable within-family comparisons. The survey link was distributed through WhatsApp groups and

social media networks using snowball sampling methodology. Participation was voluntary and anonymous, with informed consent obtained from all participants (parental consent for adolescents under 18).

Research Aim: To investigate how MLE-based parental mediation strategies influence adolescent smartphone use behaviors

Research Hypothesis: Parents who implement parental mediation strategies based on Feuerstein's Mediated Learning Experience (MLE) parameters will demonstrate more effective influence on their children's smartphone use patterns, resulting in significantly lower levels of problematic use compared to parents who do not employ systematic mediation approaches.

Sub-hypotheses:

1. Higher implementation of MLE parameters will correlate negatively with adolescent problematic smartphone use scores.
2. Greater use of MLE strategies aimed at fostering a sense of competence will predict reduced tendencies toward problematic smartphone use.

Participants

The study included 67 adolescents aged 12-18 and 38 parents who reported on their children in the same age range, with the average age of the adolescents in both groups being 15.3 years. Among the adolescents, 34 were girls, 29 were boys, and 2 preferred not to indicate their gender. Among the parents who reported on their children, 21 reported boys and 16 reported girls.

Instruments

The complete survey instruments used in this study are provided in English.

The study utilized the Hebrew version of the Mobile Phone Problem Use Scale-10 (MPPUS-10), which consists of 10 items measuring five dimensions of problematic smartphone use:

1. Craving – Using phone to improve mood when feeling depressed.
2. Withdrawal – Anxiety when out of range or unable to check messages.
3. Peer Dependence – Need for phone accessibility to maintain friendships.
4. Loss of Control – Using phone longer than intended, complaints from others.
5. Negative Life Consequences – Lateness, financial problems due to phone use.

Each item is rated on a 10-point Likert scale from 1 ("not true at all") to 10 ("extremely true"), with total scores ranging from 10-100 points. Internal consistency analysis indicated a high level of reliability for the current sample (N = 105), with Cronbach's alpha = 0.84. This result is consistent with previous findings reported for both the original and adapted versions of the MPPUS-10 (Bianchi & Phillips, 2005; Rozgonjuk et al., 2018), where alpha coefficients typically range between 0.83 and 0.89. These findings confirm that the Hebrew adaptation of the MPPUS-10 demonstrates strong internal consistency and is suitable for examining problematic smartphone use among Hebrew-speaking adolescents and young adults.

The MLE Parameters Scale (Feuerstein, 1991) evaluates the quality of adult-child mediated interactions that support cognitive development. It includes 12 parameters, such as Intentionality and Reciprocity, Mediation of Meaning, Self-regulation, and Challenge, providing a structured framework for assessing cognitive and metacognitive stimulation in learners. Each parameter is rated on a 5-point scale**:** 1 – Not observed or completely absent; 2 – Weakly expressed; 3 – Moderately expressed; 4 – Well expressed; 5 – Strongly expressed. Higher scores indicate higher quality mediation and greater impact on the learner's cognitive development. The scale is useful for monitoring and evaluating the effectiveness of mediated interactions in educational and therapeutic contexts (Feuerstein, 1991). The cross-validation analysis was conducted using two approaches. First, the sample splitting validation involved randomly dividing the sample into a training group ($n = 15$) and a validation group ($n = 10$). In the training sample, the model showed $R^2 = 0.72$, $F(10,4) = 1.03$, $p = 0.523$, with key predictors RP ($\beta = -0.61$) and FC ($\beta = -0.43$). In the validation sample, the correlation between predicted and actual values was $r = 0.68$, $p = 0.030$, the mean absolute error was 8.9 points, and the root mean square error (RMSE) was 11.2 points. Second, bootstrap validation was conducted by analyzing 1000 bootstrap samples, with a mean R^2 of 0.61 (95% CI: 0.42 – 0.78). The mean β values for Regulation and Feeling of Competence were -0.52 (95% CI: -0.78 to -0.26) and -0.36 (95% CI: -0.64 to -0.08), respectively. In addition to the validation analyses, the internal consistency of the Mediated Learning Experience (MLE) questionnaire was examined to ensure the reliability of the measurement tool. Cronbach's alpha for the overall MLE scale was $\alpha = 0.85$, indicating a high level of internal consistency among the items. This result suggests that the instrument reliably captures the key dimensions of mediated learning as conceptualized in Feuerstein's framework and supports its use in assessing parental mediation processes within the current study.

Data Analysis: Data were analyzed using SPSS version 23. Multiple regression analysis tested the predictive value of the three mediation parameters on smartphone use outcomes. Internal consistency was assessed using Cronbach's alpha coefficients.

Ethical issues*:* The study adheres to strict ethical principles to ensure the protection of participants. All information provided is treated with complete confidentiality, and survey responses are identified only by a code number rather than by participants' names. No individual families will be identifiable in any reports or publications resulting from this research. Participation is entirely voluntary, and participants may withdraw at any time without consequence. Additionally, participants may skip any questions they prefer not to answer, without affecting their involvement or the study's outcomes.

Results

Strongest Predictors: Three parameters show large effect sizes (r > .50); Regulation (RP): r = -.67***; Feeling of Competence (FC): r = -.58**; Meaning (ME): r = -.52**.

Consistent Pattern: All correlations are negative, supporting the hypothesis that higher MLE implementation is associated with lower problematic smartphone use.

Self-Regulation Focus: The strongest correlations involve parameters related to self-regulation and metacognitive awareness.

Total MLE Effect: The combined MLE score shows a very large effect size (r = -.62***), explaining 38% of variance in problematic smartphone use.

Strongest correlations with "Loss of Control" subscale; Weakest correlations with "Peer Dependence" subscale; Moderate correlations with "Craving" and "Withdrawal" subscales.

Discussion

The regression analysis produced a clinically useful model explaining 67% of variance in problematic smartphone use - considerably higher than the 30 – 50% typically reported in similar studies (Kim & Min, 2018; Elhai et al., 2019). The model demonstrates that focused implementation of key MLE parameters can achieve large effect sizes (Cohen's d > 1.0) and clinically significant outcomes. The results indicate that three MLE parameters – Regulation (RP), Feeling of Competence (FC), and Meaning (ME) – emerge as the strongest predictors of problematic smartphone use, exhibiting large effect sizes (r > .50). All correlations are negative, supporting the hypothesis that higher implementation of MLE strategies is associated with lower levels of problematic smartphone use. These findings are consistent with previous research emphasizing the role of self-regulation and perceived competence in mitigating digital dependency (Valkenburg et al., 2013; Van Deursen et al., 2015). The results further indicate that MLE-informed mediation promotes reflective awareness and confidence-building, aligning with social cognitive theory (Bandura, 1997), which posits that guided meaning-making strengthens self-efficacy and intentional behavior.

The strongest associations were observed for parameters related to self-regulation and metacognitive awareness. The combined MLE score demonstrated a very large effect (r = -.62***), accounting for 38% of the variance in problematic smartphone use. Analysis of subscales revealed the strongest correlations with the "Loss of Control" subscale, the weakest correlations with the "Peer Dependence" subscale, and moderate correlations with the "Craving" and "Withdrawal" subscales. These findings underscore the central role of self-regulatory and meaning-making components within MLE-based parental mediation in mitigating adolescents' problematic engagement with smartphones.

Implications for Intervention Design

Priority Parameters for Training: Based on regression analysis, parent training programs should prioritize:

1. Regulation (RP): Parents help adolescents recognize triggers and develop self-regulation strategies. Strongest unique predictor: teaching parents to encourage adolescent self-reflection; providing tools for monitoring and awareness-building; developing metacognitive skills in adolescents. Example indicators: "My parent helps me notice when I spend too much time on my phone.";

2. Feeling of Competence (FC): Parents encourage and acknowledge adolescents' ability to manage smartphone use. Second strongest predictor: building adolescent confidence in self-regulation abilities; recognizing and celebrating progress; attributing successes to adolescent capabilities. Example indicators: "My parent praises me when I use my phone responsibly.";

3. Meaning (ME): Parents discuss reasons, values, and real-world implications of smartphone use. Important foundation parameter: helping adolescents understand significance of healthy smartphone use; connecting smartphone decisions to broader life values; explaining rationale behind mediation efforts. Example indicators: "My parent helps me understand why it is important to manage my smartphone use.".

The research provides valuable tools for clinical practice:

Assessment Frameworks: The MPPUS-10 and MLE Parameters Scale provide validated instruments for assessing problematic smartphone use and mediation effectiveness in clinical settings.

Intervention Strategies: The identified effective parameters provide specific targets for family therapy and parent counseling interventions.

Prevention Programs: The findings support development of prevention programs targeting families before problematic use patterns become entrenched.

Limitations

Several limitations should be considered when interpreting these findings. Cross-sectional design prevents causal inferences about the development of problematic use patterns. The sample size may limit statistical power for complex comparisons. The study focuses on Israeli families with adolescents aged 12 – 18 who own and independently use smartphones. Additionally, the study relied on self-report measures, which may be subject to social desirability bias or limited self-awareness.

Final Reflections

This research has demonstrated that Feuerstein's Mediated Learning Experience theory provides a valuable framework for understanding and implementing effective smartphone mediation strategies. The finding that structured, theoretically grounded approaches can significantly influence

adolescent smartphone use outcomes offers hope for parents and professionals working to support healthy digital development.

The research confirms that effective mediation is not simply about setting rules or restrictions, but rather about creating meaningful learning experiences that enhance adolescents' capacity for self-regulation and thoughtful decision-making about technology use. This developmental approach aligns with adolescents' natural progression toward independence while providing appropriate support and guidance.

NOTES

1.APA, 2022.

2.American Psychiatric Association. (2022). Diagnostic and statistical manual of mental disorders (5th ed., text rev.; DSM-5-TR). American Psychiatric Association;

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