



# KONFERENCIAKÖTET

Conference Proceedings

**Nemzetközi tudományos konferencia  
a Magyar Tudomány Ünnepe alkalmából**

International Scientific Conference  
on the Occasion of the Hungarian Science Festival

**Sopron, 2024. november 7.**

7 November 2024, Sopron

**FENNTARTHATÓSÁGI ÁTMENET – INNOVÁCIÓS  
ÖKOSZISZTÉMÁK – DIGITÁLIS MEGOLDÁSOK**

SUSTAINABILITY TRANSITIONS – INNOVATION ECOSYSTEMS – DIGITAL SOLUTIONS

Szerkesztők / Editors:

RESPERGER Richárd, SZÉLES Zsuzsanna, TÓTH Balázs István

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# **An Evaluation of Nudging Strategies in Adult Education: A Systematic Literature Review of Their Influence on Learning Behaviour**

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*University of Sopron, Alexandre Lamfalussy Faculty of Economics*

## **Abstract:**

This literature review analyses the effectiveness of nudging strategies in adult education. Nudging is understood as the use of subtle cues and incentives to promote behavioural changes in learners. The key feature of this approach is the steering of behavioural change in a positive direction without using prohibitions or coercion. The aim of this review is to present the existing research coherently and to provide a comprehensive overview of the various nudges and their effectiveness. The review draws on literature from behavioural economics and pedagogical psychology related to nudging in learning environments. The results show that the use of rewards and positive reinforcement can lead to a positive effect on learning behaviour, resulting in increased motivation among learners to complete their tasks and actively participate in the learning process. Nevertheless, there remains a research gap regarding the effectiveness of different nudging methods and their specific application in adult education. This gap highlights the need for further experimental studies to investigate the application of nudging methods in real-world settings. The findings of this review provide important insights for future research directions and practical applications in adult education.

**Keywords:** behavioural change techniques in education, educational behavioural strategies, nudging in education, pedagogical psychology, systematic literature review

**JEL Codes:** D81, D91, I21, I25

## **1. Introduction**

Adult education is becoming increasingly important in our society. With the growing need for lifelong learning, more and more people are also taking part in educational programmes in later life in order to adapt to technological, social and economic changes (Rennert, 2017; Vater 2021). Nevertheless, many adults face challenges such as lack of motivation, lack of time or fear of failure, making effective learning difficult (Dobischat & Seifert, 2005). To meet these challenges, nudging strategies are becoming increasingly important in adult education. Through subtle stimuli that influence decision-making behaviour and habits, nudges can help learners to make beneficial educational choices and develop sustainable learning habits. These strategies offer the potential to improve participation, persistence, and learning outcomes in adult education (O'Hara & Sparrow, 2019).

To better understand the effectiveness of these strategies, a systematic literature review was conducted of previous research to comprehensively examine existing studies on nudging strategies in adult education. This method provided a structured overview of existing research and helped identify the research gap. The systematic literature review enables an objective and comprehensive summary of existing studies, facilitating a well-founded evaluation of the effectiveness of nudging strategies. As a result, the effectiveness of the various strategies in different contexts could be assessed and at the same time a clear picture of the gaps and opportunities for future research created. In particular, the aim is to investigate which nudging strategies are

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effective and how they influence learning behaviour. Although nudging strategies are increasingly being researched and applied in various fields, such as healthcare or behavioural economics, their potential in adult education has so far been insufficiently explored. In environments marked by individual challenges and diverse learning needs, these strategies offer an innovative approach to positively influencing adult motivation and learning behaviour. This leads to the following research question: *Which nudging strategies in adult education have an influence on learning behaviour?*

## **2. Theoretical Background**

To provide a solid foundation for this research, it is important to explore the theoretical underpinnings of nudging, starting with a clear definition of the concept.

### **2.1 Definition and Concept of Nudging**

The term ‘nudging’ comes from the English language and means *to nudge* or *to push* (Bornemann & Smeddinck, 2016). This term makes it clear that nudges are subtle impulses that aim to steer behavioural changes in a specific, positive direction without using direct coercion or prohibition. Nudges often work in the background and guide decisions through small, targeted adjustments to the decision-making environment that appear inconspicuous at first glance. This approach has its origins in behavioural economics, a discipline that combines psychological insights with economic models to better understand and control human behaviour (Weijers et al., 2021). While classic economic models assume that people make purely rational decisions, behavioural economics shows that decisions are often influenced by emotions, cognitive biases and social norms. Nudging uses precisely this knowledge to create effective incentives that can steer behaviour in the desired direction. In contrast to traditional approaches, which often rely on persuasion or educational measures, nudging focuses on shaping the decision-making environment in such a way that desired behaviour is encouraged without restricting the individual's freedom of choice (Bornemann & Smeddinck, 2016; Thaler & Sunstein, 2008). The aim is to use small, targeted changes in their environment to encourage people to make decisions of their own accord that are in their long-term best interests.

### **2.2 Characteristics of Adult Education**

Adult education plays a central role in promoting lifelong learning and the further development of skills and knowledge among adults (Kade et al., 2007). It enables gaps in education to be closed, individual potential to be realised and both personal and social perspectives to be broadened through in-depth educational processes. In addition, adult education delivers measurable social and economic benefits by strengthening the employability and innovative capacity of skilled workers while contributing to the stability and prosperity of society (Bynner & Parsons, 2002; OECD, 2021). Given its growing importance, it is therefore crucial to develop strategies that can specifically promote learning behaviour and support success in achieving educational goals.

However, adults often face specific challenges that can make learning more difficult, such as lack of time, family commitments or lack of motivation. These barriers highlight the need for innovative approaches to positively influence learning behaviour and achieve sustainable educational outcomes (OECD, 2021). Nudging strategies are a promising approach in this context. In adult education, these can help motivate learners to improve their behaviour in the long term and achieve their educational goals more effectively (Weijers et al., 2021). Nudging strategies have become increasingly important in recent years - both in scientific and social discus-

sions (Sunstein, 2014b). They are seen as an effective and ethically justifiable method of behavioural change that not only improves individual outcomes but also generates positive societal benefits (Bruttel et al., 2014; Sunstein, 2014b).

The targeted use of such techniques not only increases participants' motivation to learn and learning outcomes, but also generates long-term benefits such as improved career opportunities and a higher quality of life (Sunstein, 2014a; Thaler & Sunstein, 2008). The study of nudging strategies in adult education therefore not only has a theoretical significance, but also provides practical approaches to sustainably improve learning behaviour and learning experiences. The successful integration of these strategies can help adults to achieve their educational goals, broaden their career prospects and at the same time make a positive contribution to social development.

### **3. Methodology**

In the following section, the methodology of this thesis is explained in more detail. The aim is to describe the approach to collecting, selecting and analysing the literature in order to create a structured and well-founded basis for the investigation of nudging strategies in adult education.

#### **3.1. Research Design**

This thesis is based on a systematic literature review that aims to identify, evaluate and integrate existing research findings on nudging strategies in adult education in a structured way. The approach enables a comprehensive survey of the current state of research and forms the basis for well-founded conclusions and recommendations.

The literature search process began with the selection of relevant scientific databases, including Google Scholar, PubMed, ERIC and Web of Science. To find the relevant studies, specific keywords and phrases such as nudging strategies in adult education, behavioural economics and learning or effectiveness of nudges in lifelong learning were used. These search terms were used in combination to ensure the breadth and depth of the research. The selection of studies was based on three central criteria.

Firstly, the focus was on studies that used quantitative approaches, as these make trends in behaviour measurable through the analysis of numerical data such as survey results or experimental data and provide sound insights into the effectiveness of nudging strategies.

Secondly, care was taken to ensure that the studies were specifically focused on the application of nudging strategies in adult education or similar educational settings. Studies with more general topics or not directly relevant fields of application were excluded.

Thirdly, the studies were examined with regard to their suitability for hypothesising. The aim was to formulate specific predictions based on the existing literature that could serve as a basis for further research.

#### **3.2. Analytical Framework**

The analysed literature was systematically evaluated in order to gain an in-depth understanding of the impact of nudging strategies in adult education and to extract relevant findings. To this end, the studies were categorised according to specific criteria that enabled a targeted analysis. A central focus was on identifying and describing the nudging techniques used. Strategies such as default options that facilitate the desired behaviour or social norms that influence learners' decisions were examined. Visual cues and other subtle stimuli designed to encourage positive behavioural change were also considered. Particular emphasis was placed on the role of rewards and positive reinforcement, which were identified in several studies as effective means of increasing motivation to learn. Particular attention was paid to the quantitative results of the studies, which included measurable variables such as behavioural changes, participation rates or

learning progress. This data made it possible to make well-founded statements about the effectiveness of the individual strategies and to identify the most promising approaches. The most important nudging strategies and their mechanisms, effectiveness and evaluation methods are summarised in the following table (*Table 1*):

**Table 1: Overview of the effectiveness of nudging strategies**

<b>Nudging Strategy</b>	<b>Example/ mechanism</b>	<b>Effectiveness</b>	<b>Evaluation method</b>
<b>Default Options</b>	automatic course enrolment	high (up to 30 %)	control group studies, pre-post tests
<b>Reminder Nudges</b>	email reminders, push messages	medium (approx. 21 %)	surveys, correlation analyses
<b>Reward Nudges</b>	vouchers, public recognition	variable, depending on target group	ANOVA, t-tests
<b>Social Norm Nudges</b>	‘90 % of participants have completed’	high (>25 % effectiveness)	surveys, experimental designs
<b>Visual Cues</b>	coloured markings, symbols	medium to high	observations, field experiments

Source: Own presentation based on the analysed studies

In experimental designs, pre-post analyses and randomised control group studies have often been used to investigate causal effects of nudging interventions. The table shows that default options and social norm nudges are particularly effective, especially in group or automated contexts. At the same time, reminder and visual nudges also show potential, although their effectiveness depends heavily on the target group and the specific use case.

However, a key finding of this analysis is that many studies do not provide sufficient information on sample size or how to conduct power analyses, severely limiting the generalisability of the results. In addition, it was found that effect sizes were not reported in the majority of studies, making it difficult to compare different studies. Such deficits in the statistical documentation underline the urgency of standardisation in future research work in order to ensure valid and comparable results.

## **4. Results and Discussion**

In the following section, the results of the systematic literature review are presented and analysed. The nudging strategies identified are discussed in terms of their characteristics and possible applications, followed by an assessment of their effectiveness in the context of adult education.

### **4.1. Identifying and Analyzing Nudging Strategies in Education**

The analysis of the literature shows that nudging strategies such as default options, reminder nudges, reward strategies and social norm nudges play an important role in promoting learning behaviour in adult education. Each of these strategies has specific strengths that depend heavily on the target group and the context of use.

Default options are one of the most commonly used nudging strategies. Weijers et al. (2021) highlight that this method is particularly effective in reducing cognitive barriers and

guiding learners towards desired behaviours. A typical example is automatic enrolment in courses, where participants have to take active steps to unsubscribe, significantly increasing the participation rate. Damgaard and Nielsen (2018) confirm these results and stress that default options are particularly effective when learners are unsure or less motivated. However, their approach differs from that of Weijers et al. as they specifically address individual behavioural barriers and emphasise the importance of adapted implementation.

In contrast, reminder nudges, as investigated by Hummel and Maedche (2019), are particularly suitable for supporting learners in digital environments. This technique uses push notifications or emails to regularly remind learners of their goals and encourage engagement. The study shows that nudges have an average effect size of 21%, showing that nudges can have a significant impact on learning behaviour. However, it is interesting to note that the effectiveness strongly depends on the specific educational setting and context. For example, reminder nudges performed particularly well in digital learning environments, while social norm nudges performed better in cooperative learning settings. While reminder nudges are extremely effective in flexible, interactive learning settings, Weijers et al. (2021) show that their effectiveness can be limited in traditional learning environments. The difference between reminder nudges and default options lies in the type of behavioural support: default options facilitate an initial decision, whilst reminder nudges aim at continuous motivation.

Another important approach is reward strategies, which were analysed in detail by Thaler and Sunstein (2008) and Hummel and Maedche (2019). These nudges promote learner motivation through material or social incentives, such as progress indicators or rewards for achieving certain learning goals. While material rewards are particularly effective for learners with low motivation, engaged learners often favour recognition or intangible incentives (Damgaard & Nielsen, 2018). However, Hummel and Maedche (2019) point out that reward strategies are highly dependent on learners' individual preferences and social environment, which can limit their universal applicability.

Social norm nudges have also proven effective by leveraging learners' social affiliation. Highlighting positive group outcomes, such as *90% of participants successfully completed this course*, creates subtle social pressure that guides behavior toward the group goal (Hummel & Maedche, 2019). This method works particularly well in cooperative learning environments where group dynamics play a major role.

A key difference between these approaches lies in their focus on short-term or long-term behavioural change. While default options and reminder nudges often encourage immediate decisions or actions, reward strategies and social norm nudges aim to strengthen intrinsic motivation and long-term commitment. This distinction is crucial for selecting the right strategy, as different target groups and learning environments each have specific requirements for the nudges applied. The literature also shows that the effectiveness of nudging strategies depends heavily on contextualisation. Weijers et al. (2021) argue that while universal guidelines for nudges can be helpful, success ultimately depends on how well the strategy is tailored to the target group and their specific barriers. Hummel and Maedche (2019) add that context-sensitive approaches work particularly well in digital environments, while Damgaard and Nielsen (2018) highlight the importance of individual factors such as motivation and self-regulation.

## 4.2. Possible future research directions

Despite the promising results of the nudging strategies investigated to date, there are clear research gaps that need to be closed in order to gain a more comprehensive understanding of these approaches in the context of adult education. One key area that has been insufficiently researched concerns the long-term effects of nudges. While many studies document short-term changes in behaviour, it remains unclear whether and how these effects persist over longer periods of time. For example, the work of Weijers et al. (2021) points out that systematic studies on long-term changes in learning behaviour are still lacking.

A central deficit in existing research is the lack of focus on adult education, as many studies primarily examine children and adolescents. However, adults differ fundamentally in their learning behaviour: they are more reliant on self-responsibility and intrinsic motivation and have to cope with additional challenges such as work and family commitments, meaning approaches that work in schools cannot easily be transferred to adults (Damgaard & Nielsen, 2018). In addition, the heterogeneity within the target group of adults is often neglected. Factors such as educational level, cultural background or individual learning goals can have a significant influence on the effectiveness of nudges, but there is a lack of systematic research on this (Hummel & Maedche, 2019). There is a clear need to develop specific nudging strategies that are orientated towards the particular needs and challenges of adult learners. Furthermore, there is a lack of studies that examine the context dependency of nudging strategies in more detail. As Hummel and Maedche (2019) point out, the effectiveness of nudges strongly depends on the specific context, including the type of educational offer, the target group and the institutional support. For example, nudging approaches that are successful in flexible continuing education programmes for working people may be less effective in more structured, formal educational contexts. Cultural differences or the digital infrastructure that facilitates or hinders access to certain educational programmes also play an important role.

It is clear that further research is required in order to realise the full potential of nudging strategies in adult education. In particular, the investigation of long-term effects, the consideration of different target groups and the influence of specific framework conditions offer promising starting points for future scientific studies.

## 5. Conclusion

The aim of this literature review was to evaluate the effectiveness of nudging strategies in adult education and to identify existing research gaps. In particular, the specific strategies that can positively influence learning behavior were investigated. The underlying research question was: *Which nudging strategies in adult education have an effect on learning behaviour?*

The key findings show that different types of nudging strategies - including default options, reminder nudges, social norm nudges and framing - are effective approaches for guiding learners' behaviour and increasing their educational success. At the same time, it became clear that the effectiveness of these strategies depends heavily on contextual factors such as the framework conditions of the educational programme and the individual characteristics of the target groups. This emphasises the need for a differentiated and situation-specific application of nudges. These results offer valuable approaches for the practice of adult education. Institutions can use nudging strategies to encourage participation in educational programmes, maintain learner motivation and achieve long-term learning outcomes. However, additional research is needed to understand the long-term effects of nudging strategies and to optimise them specifically for different subgroups in adult education.

Future studies should focus on researching the specific needs of adults, as their learning processes differ significantly from those of younger target groups. The results of this literature review suggest that a targeted integration of nudges into adult education can not only improve the individual learning experience, but also increase the effectiveness and reach of the education system as a whole.

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