

Emailing impact on eLearning engagement in a German start-up example.

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1 Abstract

E-Learning engagement has gained importance within the past decade, not only due to the digitalization of learning through COVID-19 but socio-economic trends themselves. Therefore, this study is dedicated towards the usage of emailing as a tool to increase engagement analysing the applicability as well as the best possible strategies, in terms of email content and design. The underlying experiment involved 240 users of a digital learning platform which received emails over a time span of four weeks. The study reveals that providing users feedback on their learning path with a positive wording and design as the most beneficial possibility.

Keywords

E-Learning, Engagement, Emailing Strategies, Emailing Design, Email Notifications, Educational Motivation, Motivational Psychology

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2 Introduction

Today's fast-paced and agile economy proposes various hurdles for companies and institutions regarding the workforce's educational processes. These issues range from intransparent learning procedures to qualitative deviations in teaching due to human error. Therefore, educational technology (EdTech) start-ups have been rising within the entrepreneurship ecosystem, trying to tackle and overcome those obstacles. Especially during the current COVID-19 pandemic, EdTech has become a central role, not only in corporate but also public education. Contemplating both kinds of education, the German market, with its unique apprenticeships and decentralized educational examination systems, is opposed to even severe problems due to their comparably little government attention. To overcome these various issues in the German educational sector, I co-founded the EdTech start-up *Mozubi* offering a digital learning platform for apprenticeships and further education. The web app's focus is directed towards exam preparation covering age groups from 16 to 55 years old. By definition, the learning platform is an asynchronous learning tool (Mulla, Osland-Paton, Rodriguez, Vazquez & Kupesic Plavsic, 2020) and classified as self-directed since the user has a learning plan and no further guidance accompaniment (Lalitha & Sreeja, 2020). Regarding the business model, *Mozubi* solely offers their services in a business-to-business-to-user (B2B2U) approach meaning that companies are the customers, and the employees are the actual users of the platform. Hence, one of the economic key metrics used, is user satisfaction since the users are the advocates within the company to use the platform and decrease customer churn rates continuously. In analysing the past 50 active users (refer to 5.1), I found out that user satisfaction correlates with platform engagement. Thus, keeping the economic target in mind of increasing user retention, this study is dedicated to exploring tools and methods to impact user satisfaction through their engagement positively. Given this study's circumstances (refer to 3.1), the selected method to enhance user commitment are various emailing strategies and email notifications. Resulting,

the research question emerges of how emailing can impact user engagement in eLearning. Considering the current growth in Edtech and a rise in eLearning relevance assorted with the overall goal of achieving users' high engagement, the answer to the research question gains importance and significance. Additionally, the present academic landscape does not provide any elucidating insights about the impact of email notifications on user engagement encompassing a gap in research and literature. Consequently, this study's two main components are email marketing techniques and educational motivation to create practical strategies for email notifications in an eLearning environment.

Regarding this study's structure and target, the research and experiment aim to answer the research question, as mentioned above, through four subsequent goals. As a result, the increase of attention and awareness, motivation and interest, usage and engagement and satisfaction set the key drivers. In order to set up this experiment, the structure of this study is divided into two major columns. Primarily, the literature review is starting with an overview of possible opportunities to increase eLearning engagement. The two main questions needed for the experiment are answered afterwards, being the design and composition of an effective email as well as applicable motivational strategies to achieve the targets of this project. Following the literature section, the methodology is depicted, explaining how this paper was conducted and which emailing strategies were chosen. Based on the four subliminal targets, the empirical part will briefly picture the experiment's retrieved data. Continuing, the results and implications will be presented, answering the critical question of this study.

3 Engagement Enhancement in asynchronous eLearning

The following section will set the context of this study and describe the two main pillars underlying the experiment. Moreover, the literature regarding e-mailing strategies will be analysed to support the study's set-up. Lastly, motivational strategies will be depicted.

3.1 Tools to increase engagement

To increase engagement with platforms or applications, literature proposes various strategies ranging from product development and UX/UI design to built-in social media opportunities (Pham & Chen, 2019). For instance, Anderson (2006) describes that users seek to find relevant content as fast as possible and easily understandable in today's fast and information-filled society. Therefore, the content needs to be adequate for the user. Moreover, another study indicates the importance of interfaces, design, and visuals within the learning environment to be simple and straightforward, not to overwhelm the user (Coultis, 2020). Correspondingly, new product features and functionalities are seen as an incremental tool for user motivation to engage with the platform (Pham & Chen, 2019). A major aspect introduced by various researchers is communication (Wang & Fesenmaier, 2003). However, communication is divided into different types (Quigley, 2020), such as update notifications or new content releases (Pham & Chen, 2019). The interactive frame of reference even suggests built-in social media tools for cross-user communication (Kukulska-Hulme & Traxler, 2005). Mobile applications and eLearning tools especially provide insights about the importance of notifications to enhance user engagement (Warren, Meads, Srirama, Weerashinghe & Panaiagua, 2014). Lastly, Pantea and Pop (2010) elaborate that a standard tool used to notify users are email notifications and that according to their study, 65% of users immediately open their device after receiving an email. Considering the circumstances of *Mozubi*, new product updates or content adjustments are not possible to implement in the scope of this study due to company restrictions.

Furthermore, as the learning platform is a web-based solution, mobile notifications cannot be used as an instrument to increase engagement. Thus, given the environment, emailing strategies and email notifications are the only possibility to enhance user engagement with the learning platform resulting in the critical research question of this work project: “How can Email

Notifications increase eLearning engagement?”. The matter arises which strategies within those emails to use regarding the increase in user engagement. Therefore, the following section will disclose several strategies regarding emailing underlying to existing literature.

3.2 Email Marketing

Emailing strategies are often comingled with tactics or techniques (Gill, 2020), and to implement qualitative strategies, the difference needs to be understood. Strategies will refer to superordinate plans to achieve the goal referring to the purpose of an email (Barad, 2018), whereas the tactics and techniques are specific components of the strategies (Felton & Pugliese, 2017). The following part will examine the literature provided on emailing strategies and techniques in the avenue of marketing, their subjectivity to motivation, awareness, and interest. Pantea and Pop (2010) mention emailing notifications, incoherence to motivational and volitional messages. Hereby the emails focus on individualization and methodology of personalization, which, according to the definition of strategies above, can be classified as a technique rather than a strategy. However, marketing experts provide an even more perceptive view regarding the design, structure, or possibilities in emailing. Studies in marketing, more precisely in email marketing, provide various insights on how an email should be designed, structured, and arranged (Leung & Tsou, 2019).

Firstly, several studies indicate the importance of the content and personalization (Sigurdsson, Menon, Sigurdarson, Kristjansson & Foxall, 2013). For instance, an email sent to a customer should contain personalized components, as suggested by Budac (2016), aligning with the studies mentioned above. Following, aspects such as the segmentation of subscribers are mentioned by interviewee C to inform the receiving part about user-specific and relevant content (Taiminen & Ranaweera, 2019). Taking a closer look into the content composition, various studies propose to test content, subject lines, or the language used, leading to the next key aspect, the email design (Leung & Tsou, 2019).

Kumar (2016) recommends short subject lines to increase opening rates (OR) and creative email design to enhance click-through-rates (CTRs). The relevance of the shortness of texts (Dapko & Artis, 2014) or the use of visuals is corroboratively pointed out by various papers (Lorente-Páramo, Chaparro-Peláez & Hernández-García, 2020). Overall, an email's design should be the primary focus to increase opening and CTRs (Biloš, Turkalj & Kelić, 2016). Furthermore, the literature proposes emails to have a mobile-friendly layout to guarantee the highest success rates in terms of click-through and engagement (Schaefer & Hetman, 2019).

Different studies depict the point in time when email marketing should be used in the customer life cycle and which effects are to be considered (Pop & Acarinei, 2011). Hereby, the resolution in customer emailing is found to be during the weekdays instead of the weekends and a rather late morning time to reach the highest attention (Chittenden & Rettie, 2003).

Another criterion indicated by academia is the effect of call-to-action (CTA) on the click-through-rate (Bonfrer & Drèze, 2009). Therefore, clear and inviting CTAs in an email are necessary to not only create higher interest and expectations of the advertised subject but affect returns on emailing through the recipient's willingness to engage with the email and follow the action to be done (José-Cabezudo & Camarero-Izquierdo, 2012).

Nevertheless, literature in email marketing primarily concentrates on the relevance of design and structure of an email and their associated impact on email marketing metrics such as CTR, opening rates, or bounce rate (Kumar, Bezawada, Rishika, Janakiraman, & Kannan, 2016). Hence, concrete recommendations on content strategies are not provided despite being relevant for the recipient (Budac, 2016). Endorsing the literature reviews findings, interviewee C fostered that strategies used in practice are mostly created by companies themselves due to the customization of the mailing strategies to their various recipient groups. Moreover, he alluded to the example of mailing intentions as one reason for the lack of emailing strategies in academia, continuing with an example of sales or brand awareness as the essential purpose of

marketing emails. Complementary, Hartemo (2016) reveals that out of 95 papers, which have been analysed in the context of email marketing, none focused on the intersection of email marketing and empowerment through these emails, supporting the lack of emailing strategies and their effect on the receivers. Overall, the section mentioned above will be used in the experiment to create and efficiently design emails. However, to obtain insights on the empowerment and motivational context of messages, the next part will analyse the potentials in psychological measures to find adequate strategies to be incorporated and applied in motivational emailing messages.

3.3 Psychological Motivation Strategies in Education

Having the goal of developing clear strategies for emailing content, psychological measures to motivate in education are considered to find components to be embedded in the email notifications. As a result, academia provides various insights on motivational strategies in education while incorporating psychological aspects (Keller, 2008).

In contemplation of finding the right motivational strategies, one has to understand the fundamentals of educational motivation. Educational design theories describe strategies to motivate students to engage more in their learning path, mainly focusing on the psychological aspect irrelevant of location (Hartnett, 2016). The term educational design is impacted by J. M. Keller, who focused on motivational components of education (Keller, 1987) and created the attention, relevance, confidence, and satisfaction model (ARCS) (Keller, 1999a). While the ARCS model by Keller (Keller & Suzuki, 2004) defines a framework to develop motivation strategies in eLearning, the model does not propose direct strategies rather than concepts, triggers, and drivers of motivation (Keller, 1999b). Further research depicts that the foundation and underlying substructure of motivation in learning are to arouse students' curiosity and sustain it (Keller, 2008). Affirmatively, interviewee A, an educational psychologist, supports the underlying premise of inquisitiveness as a primary trigger to motivate students.

Moreover, a profound groundwork of motivation includes the comprehension of intrinsic and extrinsic motivation (Ryan & Deci, 2000). Thus, intrinsic motivation is defined by motivational factors that are solely triggered by individual drivers that are not influenceable by external determinants (Lepper, Corpus & Iyengar, 2005). On the contrary, extrinsic motivation can be depicted as motivational elements, externally insinuated and affected (Ryan & Deci, 2016). Considering the fundamentals of motivational aspects in education, academia reveals the following strategies to be effective.

First of all, students are motivated by achieving goals (Muis, Ranellucci, Franco & Crippen, 2013). The setting of goals provides people with a future-focused state they want to approach (Interview B). This future-oriented state of mind is mainly positively designed by the person who sets their goals (Hulleman, Schragger, Bodmann & Harackiewicz, 2010). Therefore, to achieve this positive condition, people tend to be motivated (Muis et al., 2013). Moreover, the achievement of goals not only finds its application in education but also in motivational theories to increase physical activities, supporting the relevance of motivation (Munson & Consolvo, 2012). This motivational strategy is, by definition, classified as an extrinsic motivational factor since the goals can be subject to external suggestions (Lee, McInerney, Liem & Ortiga, 2010). In the following, this strategy will be described as “**goal-setting**”.

Secondly, a common motivational factor mentioned by academia is “**self-efficacy**” (Hartnett, 2016). Hereby, self-efficacy stresses a person’s belief in his competencies, skills, and capabilities (Bandura, 1977). Additionally, the strategy of self-efficacy is one of the fundamental core components of educational design and social cognitive theory (Usher, 2016). Interviewee A encloses self-efficacy as an enshrined state in an individual psychological mind, and that external impacts can hardly affect a change of this state. This statement is also underlined by various studies such as Dinther et al. (2011), mentioning students’ previous

experience, prior familiarity with a subject, or former duration spent with a topic field. Therefore, self-efficacy can be considered as an intrinsic motivational factor.

Thirdly, the concept of rewarding is a strategy used in educational design (Muis et al., 2013). Rewarding is associated with *receiving something for delivering something* and best described by compensation (Hidi, 2015). Rewarding systems are not only used in education but also in parenting to teach good habits or in work-life through the simple context of salary as a compensation tool (Sailer, Hense, Mayr & Mandl, 2017). It is commonly used through “**gamification**”, which simulates rewards to be earned (Interview A). A correlating aspect of rewarding and gamification is the according visible status and to show other participants the achievement (Dicheva, Dichev, Agre & Angelova, 2015). Overall, rewarding is considered an extrinsic motivational component because it can externally envision rewards and social status (Mitchell, Schuster & Jin, 2020).

Moreover, as already mentioned above, curiosity and hence, “**personal interest**” in a specific field can trigger motivational implications (Keller, 2008). Resulting, the interest relates to information that is provided to the recipient and delivers additional value arousing the attention and awareness (Linnenbrink-Garcia & Patall, 2016). Enhancing the interest in a specific topic or field can deepen the desire for knowledge and expertise in this area leading to a motivational effect (Park & Yun, 2017). Interest-based motivation explores the individual’s identification with the suggested information simulating a state of attention (Harackiewicz, Smith & Priniski, 2016). Therefore, personal interest can be regarded as an external motivational aspect (Shen, Chen, Tolley & Scrabis, 2020).

Linnenbrink-Garcia, Patall, and Pekrun (2016) mention “**causal attribution**” and the implicit theory of intelligence as a strategy to increase motivation. More precisely, causal attribution describes the effect of explaining outcomes to themselves and understanding if a cause to do an action can be used for other causes to do so (Rajabalee et al., 2020). For instance, if a student

receives bad grades in mathematics, he is more likely to perceive himself as a *lousy* student in future mathematics tasks because he causally attributes the previous events to future ones (Weiner, 1986). However, as causal attribution is based on prior experiences and can hardly be affected, it is categorized as an extrinsic motivational element (Shell & Husman, 2008).

Another aspect often mentioned in educational design is encouraging “**feedback**” (Keller, 1987). The ability to know strengths and weaknesses and, thus, to mitigate knowledge deficits encourages students (Keller, 2008). However, to reach the most efficient outcome, interviewee A directly aligns the feedback strategy with positive wording techniques. More precisely, she indicates that pointing out knowledge deficits can be comprehended as unmotivating, whereas depicting fundamental knowledge areas can impact the recipient through an increased eagerness to learn more. Nevertheless, promoting feedback and giving advice for improvement can be classified as an extrinsic motivation strategy, especially in eLearning through data analysis (Oker, Pecune & Declercq, 2019).

The last concept provided and partially evolving out of the above-mentioned strategy of rewarding (“gamification”) is the feeling of relatedness and social affiliation (Linnenbrink-Garcia et al., 2016). Regarding this strategy, students desire a feeling of social acceptance and understanding to create a relation towards the topic and why it should be necessary for the student (Keller, 1999a). Relatedness is often also explained as external proof of understanding for one’s thoughts or feelings (Kaufman & Dodge, 2009). For instance, interviewee B mentioned the example of telling someone stories and experience reports of people who have undergone the same path as the student is confronted with (Interview B). Therefore, relatedness and social approval can be feigned by external determinants leading to the classification as extrinsic motivation. In the following, this strategy will be named “**social proof**”.

4 Methodology

This section elaborates the methodology of the literature review, interviews held, and the experiment undertaken within the scope of this study. Furthermore, the explanatory path for the selection of the emailing strategies is portrayed.

In advance of explaining the research techniques, one has to remark that the global literature landscape regarding email notifications within educational technologies indicates high scarcity. So far, academia has explored the areas of notifications in mobile apps or built-in (in-app) notification systems, taking the perspective of notifications. Oppositely, analysing the literature from an emailing point of view, the presented scope includes email marketing techniques and tactics. Therefore, aiming to a full overview of the email notification possibilities, the literature review was not only confined to A journals but also surveys of secondary literature and economic experts in the sector. The primary research was executed through databases such as EBSCO as well as websites of companies and professionals in the sector.

Additionally to the literature research, interviews with industry experts were conducted in educational psychology and outbound marketing experts. All interviews were unstructured and aimed at retrieving valuable information and insights about the respective topics while having an eLearning approach in mind. Questions in the interviews looked like the following:

- What are motivational triggers in education? (Interview A/B)
- How can educational strategies be applied in an email context? (Interview A/B)
- What are email marketing strategies? (Interview C)
- What are the key metrics and their relating triggers in email marketing? (Interview C)

The key insights were directly summarized in this study's respective parts and implemented as supporting elements to the literature review. The interviews were held between the 1st and 18th of September, each amounting to around one hour of duration. Due to the individual

participants' privacy protection, some of the interviews were anonymized, whereas the other interviewees gave their consent to be cited in this study.

Regarding the literature review process, the journals were sorted regarding their classification into A, B, or C journals. Afterwards, based on the journals ISSN numbers, the database was scanned for terms such as *emailing-strategies*, *-marketing* or *-notifications* and *educational-design*, *-motivation* and *-theories*. Following, the critical information of the literature was summarized in small segments and their according crucial messages. Hereby, one has to acknowledge that most of the literature, irrelevant of the publication's years, refer back to one author who has shaped the academic landscape in the past three decades of educational motivation (Keller, J.). However, since eLearning and email marketing is more of a novel approach, the time horizon was extended successively to have the most recent insights. Having depicted the most common strategies across the literature, five strategies were chosen based on the given circumstances by cooperating with *Mozubi*.

The seven proposed strategies to increase learning engagement were defined as: goal setting, self-efficacy, gamification, personal-interest, causal attribution, feedback, and social proof. However, regarding this study's context, only strategies could be used, which could be embedded in distant learning measures. Therefore, self-efficacy and causal attribution were not suitable for the study due to their comparably intrinsic orientation (Gerhart & Fang, 2015). Considering the five other strategies, all of them could be applied to email notifications. The emails' actual composition was developed together with interviewee A and B to guarantee a viable educational strategy application. The goal-setting approach was demonstrated through weekly goals for the user to be reached. With this, the future state-of-mind was virtually suggested to achieve the goals (Appendix 1). Secondly, gamification was depicted by points to be gained by the users through platform engagement. The overall goal was to collect points in order to receive badges (Appendix 1). Thirdly, personal interest was triggered by subject and

industry-specific facts (Appendix 1). For instance, previous managers or CEOs had to undergo the same examination at the beginning of their careers. The feedback strategy was used by pointing out strengths and weaknesses of the users to mitigate their learning deficits and promote studying (Appendix 1). Lastly, social-proof was provided through past-user stories and how, why, and when they used the platform to achieve their goals (Appendix 1).

Before proceeding with the methodology of the experiment, the framework has to be mentioned. The experiment was targeted at the main research question of “how email notification can impact user engagement in eLearning”. Thereby, the main objective was divided into four succumbing targets in order to make the experiment more viable and, in the meanwhile, analyse components of the study. The four key targets were to increase the following:

- Attention and Awareness (Email Opening Rates and Click-Through-Rates)
- Motivation and Interest (Login-Days and Login Frequency)
- Usage and Engagement (Average-Engagement-Rate)
- User Satisfaction (Satisfaction Survey)

All four goals had underlying metrics to be measured, as indicated in the parenthesis. To have a significant experiment size, the study included a sample size of 240 users divided into six groups (40 users per group) based on the strategies evolving of the literature review and one test group. The users' allocation to the various strategies and writing style were randomized using the `RANDBETWEEN()` function in excel as each strategy was assigned to a number from one to six. The timeframe was set for four weeks, whereas the period was divided into two sections. The primary section was concerning the first two weeks of the experiment, where the overall strategies were tested, followed by weeks three and four for the testing of the writing style and design. Keeping the primary goal of this study in mind, to increase learning engagement, this experiment included an iteration after two weeks to find the best possible

combination. Hence, weeks three and four incorporated the writing style, which was primarily emphasized in the interviews with educational psychologists and marketing literature, introducing the iteration of positive and negative wording and orientation of a message. Therefore, the positive and negative emails in weeks three and four displayed a user's strengths for the positive messages and the weaknesses, respectively, for the negative ones.

Additionally, the flattering writing style included more motivating phrases such as *good job* or *keep on doing the great work*, whereas the negative approach included phrases such as *you should focus more* or *develop your weakness into a strength*. To eliminate biases of timing and frequency, each user received one email on Wednesdays in the morning at the same time based on the findings of Biloš et al. (2016). Therefore, the emailing tool Mailchimp was used to prepare, send, and track emails and the arising data. All user data have been anonymized in the retro perspective of this study to assure data privacy protection, and the consent of each user has been given for the analysis of their data. In the experiment's aftermath, the users received a simple one-question survey about their satisfaction with their learning experience during the past four weeks to achieve a high response rate.

5 How does Emailing impact user engagement?

The following section will elaborate on the previous status quo, which is fundamental to the experiment, and the underlying validated assumption. Moreover, the retrieved data of the four-week experiment will be presented and analysed, as well as the resulting recommendations and implications for managers and EdTech entrepreneurs.

5.1 Impact of engagement on eLearning satisfaction

In order to validate the positive correlation between user engagement and satisfaction, which was ascertained by *Mozubi*, a data set of the latest 50 active users (n=50) of the platform was

considered. The two key metrics that allegedly positively impact user satisfaction were the login days on the platform and the average engagement rate (AER). The engagement rate is calculated by the following formula derived from key metrics of user-analytics:

$$\text{Engagement rate} = 2.5 * (\text{Number of read articles}) + 1.5 (\text{Number of quizzes completed}) + 110 (\text{Number of exams simulated})$$

Hereby, the coefficients indicate the average time needed for the allocated interactions on the platform based on the retrieved data (Appendix 2). To verify both variables' significance, a multiple linear regression (OLS method) was conducted with the satisfaction scale as the dependent variable and AER and login days as the two explanatory variables (Appendix 3). The results indicated that login days are not significant. Hence, a second regression, as a log transformation, was undertaken with AER as the single variable resulting in a R2 of 0.619 and AER being significant ($P > |t| = 0.000$) (Figure 1). This correlation is also supported by several case studies, where the high engagement of students with an eLearning platform resulted in better results (Rajabalee, Santally, & Rennie, 2020). Since the main target of *Mozubi* is to support users to pass their exams, the positive correlation can be justified because higher engagement leads to better preparation and better results and therefore in higher satisfaction due to an increased probability of passing the examinations. Therefore, the question arises of

Dependent Variable	Satisfaction Scale	R²	0.619			
Model	OLS	Adj. R²	0.611			
Method	Least Squares	F-Statistics	78.08			
No. Observations	50	Df Residuals	48			
Covariance Type	nonrobust	Df Model	1			
	coefficient	standard error	t	P> t 	[0.025	0.975]
constant	2.3269	0.686	3.392	0.001	0.947	3.706
Log AER	0.9312	0.105	8.836	0.000	0.719	1.143

Figure 1: Log Transformation with AER Variable (Own Illustration)

how engagement rates can be increased to achieve a substantially high satisfaction rate being implicated by the underlying sub-targets, as mentioned in the above sections.

5.2 Analysis of the impact of email notifications

The following section will delineate the experiment results in four successive sections based on the metrics used to answer this study's four subsequent questions. Regarding the process, the experiment consisted of one iteration after two weeks consolidating to an experiment duration of four weeks in total. In the first two weeks, the strategies for educational motivation were tested. Following, weeks three and four, the best performing motivation strategy was chosen and adjusted to word styling as depicted in the literature review above.

5.2.1 Email Opening and Click-Through Rates

During the first week, out of 200 email recipients 90 opened the email notifications and 68 continued onto the platform, whereas in week two, 92 users opened and 68 accessed the platform, both weeks being characterized by the emailing strategies (Appendix 4). The total amount of opened emails subject to the writing style allocated to 81 and 90 in weeks three and four, and the according CTRs accounted for 61 and 60 users respectively to the week (Appendix 5). In order to disclose the comparability, figure 2 depicts the average of the associated weeks of the opening and click-through-rate multiple. For instance, the feedback strategy had an OR of 50% in week one and a CTR of 85%. Thus, the equation $50\% * 85\% = 42,5\%$ (OR*CTR) describes the percentage of users that received the email and continued onto the platform. As a result, to rely on a dataset of more than one week, the average was taken, leading to the

following example of the feedback strategy: $\frac{week1 (42,5\%) + week 2 (45,58\%)}{sum\ of\ weeks\ (2)} = 44,04\%$.

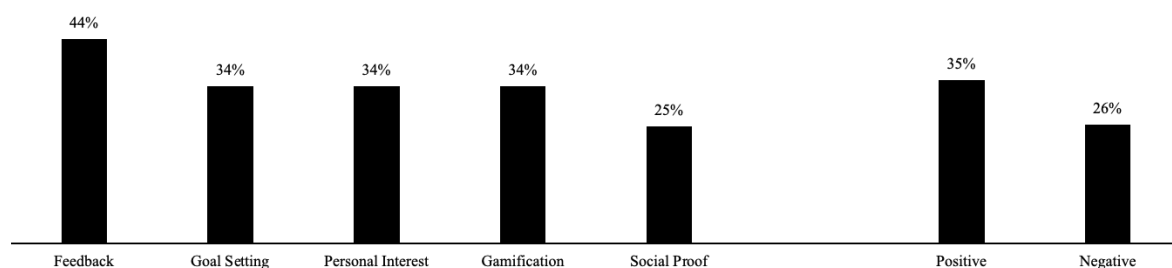


Figure 2: OR/CTR Multiple per Strategy and Writing Style (Own Illustration)

As illustrated in figure 2, the feedback strategy had the highest number of users who opened the email and subsequently went to the platform with 44%. Consecutively, the goal setting, personal interest, and gamification strategy performed equally on average with 34%. However, analysing all three strategies on a weekly basis, the gamification approach could recognize a climb from week one (28%) to week two (40%), whereas the personal interest and goal setting theory discerned a decrease (Appendix 6). Regarding the last two weeks of the experiment, the iteration induced a sole focus on one strategy (feedback) with adaptations of the writing style into positive and negative wording (Figure 5). The positive method achieved a higher multiple with 35% than the negative approach with 26%. However, considering both designs weekly, the positive technique had an overall decrease in opening rates comparably to an increase of the OR for the negative one (Appendix 5).

5.2.2 Impact on Login Rates

Regarding the impact of the email notifications, two additional variables were analysed concerning activity rates and activity frequency. Therefore, the data displayed in figure 3 and figure 4 are the weekly averages similarly calculated to OR and CTR results. The activity rate encompassed every user who logged in after a positive CTR as well as OR. The data set also included users who have read the email but not clicked directly through the email to account for a passive impact of the email. Moreover, the number of users who have a positive OR but negative CTR accounts for a small amount wherefore they could be included in the results without significantly skewing the data (Appendix 7). The activity frequency, depicted in figure 4, evinces the incidence of users logged-in for one week. Within the first two weeks, 28% of all email recipients were active compared to 31% in the last two weeks (Appendix 8). Hereby, the feedback strategy could register the highest rate with an average of 43% of all recipients being active (Figure 3). Every other strategy performed below average and lower than the test group, which achieved a 36% activity rate.

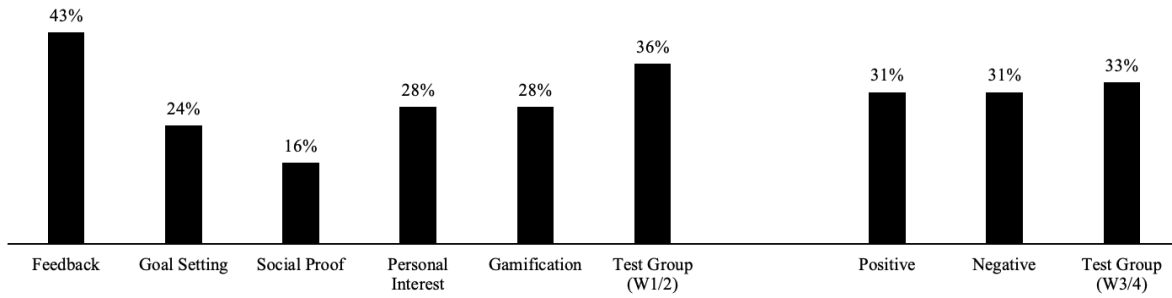


Figure 3: Active Users per Strategy and Writing Style (Own Illustration)

Considering the last two weeks of the experiment with the iteration towards the writing style, both designs (31%) indicated an average activity rate beneath the test group (33%). Contemplating the activity frequency, as shown in figure 4, every strategy, as well as writing design, presented a higher average amount of logins per week compared to the test group except the goal setting strategy. However, setting the first two weeks into comparison with weeks three and four, the latter had an overall higher average. Taking a weekly perspective, a substantial deviation across weeks can be seen (Appendix 9).

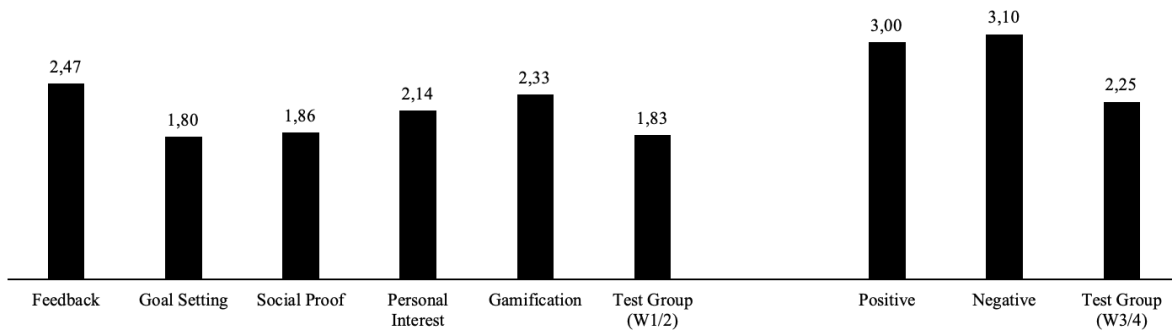


Figure 4: User Activity Frequency per Strategy and Writing Style (Own Illustration)

5.2.3 Impact on Engagement

The impact on the average engagement rate (AER) is calculated as the formula under 4.1 is described. Herby, figure 5 shows the average AER over two weeks per strategy as well as writing style. The AER is based on a positive email opening rate, analogical to the procedure applied in 4.2.2, to account for the email notifications' passive impacts. Analysing the AER, one can see that the feedback strategy was the highest performing in terms of AER (322,32)

(Appendix 10). Moreover, the gamification approach placed second best with an AER of 251,03. Additionally, all strategies performed better on average during the first two weeks than Test Group except goal setting.

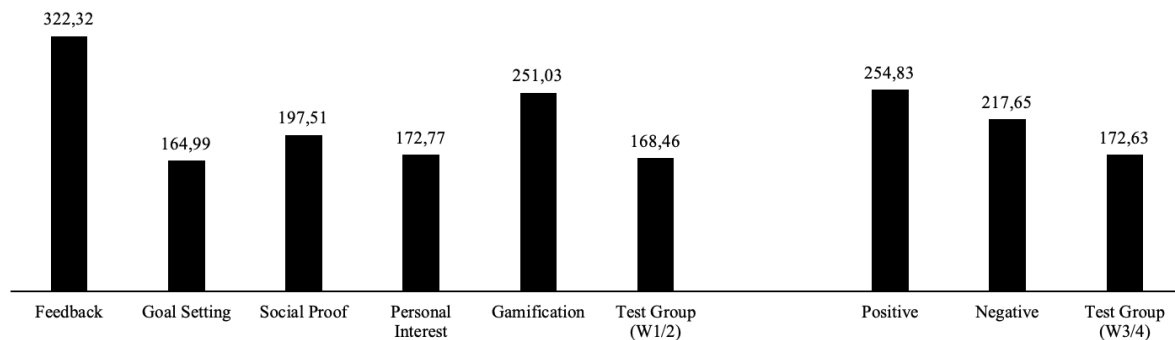


Figure 5: User AER per Strategy and Writing Style (Own Illustration)

Taking weeks three and four into account, both the negative and positive writing style resulted in higher AERs than the test group (Figure 5). Considering the overall picture, the AER across all users amounted to 212,85 in the primary phase and 215,03 after the iteration.

5.2.4 Impact on satisfaction

Lastly, figure 6 indicates the allocated satisfaction levels for each strategy, which have been generated in the aftermath of the experiment through surveys. The statistics depicted solely incorporate answers of users who have at minimum opened the email. The overall average satisfaction rate across every user amounted to 8,55 on a scale of one to ten.

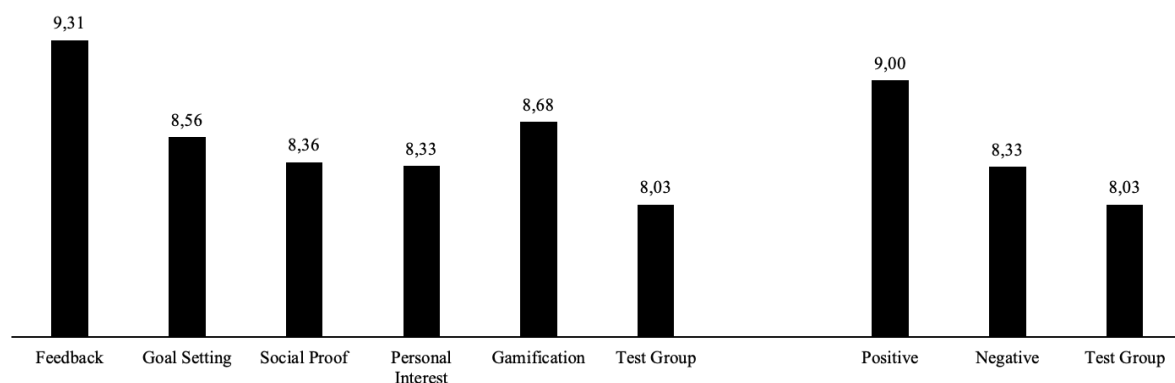


Figure 6: Satisfaction rates per Strategy and Writing Style (Own Illustration)

Regarding the results of the survey, the overall most vital performing strategy was the feedback strategy. Following, the gamification (8,68) method and goal setting (8,56) approach reported an over-average result (Figure 6). Social proof and personal interest yielded a below-average result with 8,36 and 8,33, respectively. However, all strategies were above the test groups rating with 8,03. Considering the writing style results, the positive technique could reach a satisfactory level of 9,00 compared to 8,33 for the negative and 8,03 for the test group.

5.3 Discussion: Implications for managers

Having reflected the experiment results in numbers, the section mentioned above does not indicate any implications or success factors for managers so far. To elucidate on the ramifications, the following part discloses the answers to the key question and the four subsequent targets of this study. Therefore, the ensuing part will elaborate on the four columns according to success factors and give possibilities for best practices.

5.3.1 Success factors: Attention and Awareness

This section conduces as an indicator for the awareness and attention question. The emails' opening rates and click-through rates implicate the attention and awareness that could be generated through the emails.

First of all, one must acknowledge that the email's sole comparison criterion was the subject line and the content. Regarding the length of the text and the subject line, all were similar according to the literature review's suggestions and Mailchimp as the tool used for emailing (Mailchimp, 2020). More precisely, each email subject contained one emoji as recommended, and every email text consisted of a visualization and call-to-action button. Therefore, the sole prospect subject to analysis and discussion is the content of the subject line as well as the email itself.

Interpreting the results for the OR and CTR, the most effective one was the feedback email. On a two-week average, the feedback email achieved an OR of 51,5% and CTR of 85,5%. In

comparison, the second-best performing email in terms of OR was the gamification approach with a value of 47,5%. Regarding the CTR, the runner-up was the goal setting method with a rate of 79%. Setting the first phase of the experiment into a context with the last two weeks, the feedback approach's positive method had a higher multiple with 35% over the negative one with 26%. However, comparing the mails on a weekly basis, fluctuations can be recognized, which might occur due to the individuals' external reasons. Nevertheless, answering the first sub-question of the study to achieve the most significant attention and awareness, the feedback approach can be stated as the best-performing method and in terms of writing style the positive approach.

5.3.2 Success factors: Motivation and Interest

To measure the motivation and interest that could be aroused through the emailing campaign, the key metrics to be considered are the number of users who have logged in after receiving an email and the frequency of logins of these users. Indicative, on average, the feedback strategy outperformed the other ones regarding the percentage of active users, with 43% of the recipient being active. Notable for active users is that the test group achieved the second-highest score with 36%; however, still being lower than the feedback method. Comparing the first two weeks with the following, the average during the latter was slightly higher but still below the feedback strategy's value. Moreover, the negative and positive techniques performed similarly (31%) but below the test group (33%).

The feedback strategy was placed again on the primary position during the first two weeks (2,47 logins per active user) regarding user logins frequency. Comparably, the login rates in the last part of the experiment were substantially higher for all writing styles with values of 3,00 for the positive, 3,10 for the negative, and 2,25 for the test group, leaving space for interpretation. One of the reasons for an overall increase in the frequency might be the upcoming exam dates for some of the users. Therefore, answering the second underlying question of increasing

motivation and interest, the strategy to be most effective is the feedback approach disregarding the writing style due to the similarity of results.

5.3.3 Success factors: Usage and Engagement

Considering user engagement as the third subsequent question of the study, the average-engagement-rate metrics were used for analysis. Thereby, one can see that during the first two weeks, every strategy outperformed the test group except the goal setting approach. Again, the feedback strategy could account for the most robust performance with an AER of 322,32, followed by the gamification email with 251,03. Contemplating the writing style, the AER of the positive email (254,83) not only exceeded the negative one (217,65) but also the test group (172,63). Astoundingly, comparing the login frequency with the AERs, one can derive that the length per session declined overtime during the experiment as the engagement rates dropped lower than the first two weeks, but the number of logins per user increased.

Nevertheless, finding a response to the third part of this study, the favourable method to increase user engagement on the platform is the feedback email. Hereby, considering the higher AER of the positive writing style concerning the negative technique, one can state that the positive design is preferable.

5.3.4 Success factors: Satisfaction

Lastly, analysing the impact of the emailing experiment on the satisfaction levels, an astonishing result can be seen. Every emailing strategy and writing design outperformed the test group. Taking the type of learning platform into consideration, one reason might be the self-directed learning and the users' accompaniment through emails instead of leaving them entirely dependent on themselves. However, the feedback approach can be classified as the strategy with the best impact on user satisfaction with an average rate of 9,31 on a scale of ten. Moreover, the positive approach attained a satisfactory level of 9,00, scoring substantially higher than the negative design or test group.

5.3.5 Best Practice

Having analysed each sub-target of this study according to the used strategies and writing styles, the last unanswered questions within this study's scope remain the best possible composition to use in eLearning. Therefore, in the first step, each strategy was ranked on a scale from one to six, six being the best possible value and one the worst, based on the five factors analysed in this study: OR/CTR multiple, % of activity, login frequency, AER and satisfaction level. Adjacently, based on the findings of 4.1, the AER being significant on the satisfaction level, the AER criterion was weighted double to emphasize its impact. Considering the test group and the missing component of OR/CTR for the ranking, each strategy was divided by the number of criteria included in the point allocation to create an accurate result. For instance, the feedback strategy is calculated as the following equation: $\frac{5+6+6+6*2+6}{5} = 7$.

As depicted in table 1, the feedback strategy is the best possible method in order to increase all metrics analysed in this study. The feedback approach achieved the best positioning in each category and an overall score of seven points leading to rank number one. Nevertheless, in comparison with the test group, depending on which particular metric is set as a target or goal for eLearning, each strategy can be recommended to increase engagement exceptional of the goal setting strategy. As a result of this, the before-mentioned method performed lower than the test group indicating a negative impact on eLearning. Conclusively, if the target is to increase the AER, each strategy can be recommended; however, regarding its efficiency, the feedback strategy still positions itself as the most effective one in comparison. Therefore, the best practice in terms of strategy would be the feedback approach (Table 1).

Table 1: Ranking of Strategies based on all Criteria (Own Illustration)

Strategy/Criterion	OR/CTR	% of activity	Login frequency	AER	Satisfaction Level	Overall Points	Rank
Feedback	5	6	6	6	6	7	1
Gamification	4	4	5	5	5	5,6	2

Personal Interest	4	4	4	3	2	4	3
Social Proof	1	1	3	4	3	3,2	4
Goal Setting	4	2	1	1	4	2,6	6
Test Group		5	2	2	1	3	5

Continuing with the analysis of the writing styles, the approach and calculations were made based on the strategies' example. The scale ranged from three to one point, with three being the best and one the lowest (Table 2). Within this study's range, the positive approach in wording and orientation of an email could be recognized as the best method positioning itself in the first place.

Table 2: Ranking of Writing Styles based on all Criteria (Own Illustration)

Style/Criterion	OR/CTR	% of activity	Login frequency	AER	Satisfaction Level	Overall Points	Rank
Positive	2	2	2	3	3	3	1
Negative	1	2	3	2	2	2,4	2
Test Group		3	1	1	1	1,75	3

Overall, answering the critical question of this project, the best-practice recommendation would be to implement the feedback strategy with a positive writing style as it leads to the best possible engagement.

6 Conclusion

This study aimed at answering the question of how emailing can impact engagement in an eLearning environment. In order to find an adequate response, different strategies and writing styles were tested together with the start-up *Mozubi* and their users (n=240). Accordingly, the findings indicated that providing feedback to users via email is the most effective strategy. Thereby, using a positive wording style does influence the engagement in the most beneficial way. However, this study also is accompanied by its limitations. First of all, the emailing did

not consider any psychological or demographical factors influencing the email recipients. Moreover, since the user base was randomized, the sample might not be indicative due to externalities, such as lack of time of the users or the circumstances provided by COVID-19. Additionally, the users within the sample size of 240 might have a comparably dynamic behaviour, which could lead to a distorted result due to the personal learning tendency of the users. Lastly, as the emailing content applied theoretical theories in collaboration with the interview partners, the layout might consist of subjective components. Following the limitations, the project leaves opportunities for further research. At this moment, other learning platforms providing a synchronous and asynchronous learning experience could be investigated subject to emailing impact. Moreover, equivalents such as language learning platforms, executive or higher education can be examined as the motivation to learn and the eagerness to study might be different from the user group in this study. Lastly, further areas for research could be other emailing strategies and methods as well as tactics that have been uniformed in this study, as indicated in the methodology section. Concluding, this project established a strong foundation to answer the impact of emailing in asynchronous eLearning and depicted the best practice for execution. Nevertheless, as indicated above, this study leaves questions for avenues for further research.

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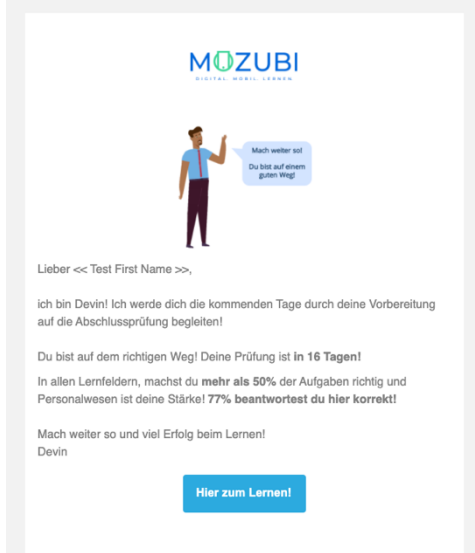
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IV. Appendix

Appendix 1: Example Emails for Strategies and Writing Style

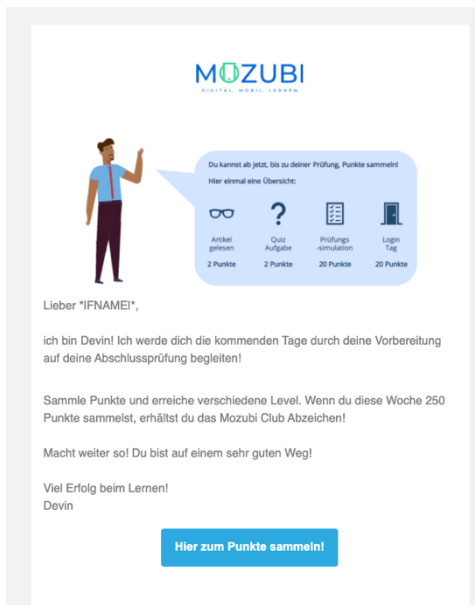
Feedback Mail Weeks 1-2 (*Subject Line: Deine Stärke: Personalwesen* 🎓)



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Unter folgender E-Mail kannst du uns erreichen:
support@mozubi.app

Gamification Mail Weeks 1-2 (*Subject Line: Lernen & Punkte sammeln!* 🏆)



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Unter folgender E-Mail kannst du uns erreichen:
support@mozubi.app

Goal Setting Mail Weeks 1-2 (Subject Line: Die Lernziele für die nächsten 7 Tage 📝)



Hier findest du deine Wochenziele, um dich bestens auf die Sachkundeprüfung vorzubereiten:

Artikel gelesen	Quiz Aufgabe	Prüfungssimulation
50	150	6

Ich werde dich auf dem Laufenden halten! Viel Erfolg beim Lernen! Mach weiter so!

Hallo *IFNAMEI*,

ich bin Devin! Ich werde dich die kommenden Tage durch deine Vorbereitung auf deine Abschlussprüfung begleiten.

Siehe oben, was dein wöchentliches Ziel sein sollte, um dich bestens vorzubereiten. Du schaffst das!

Viel Erfolg beim Lernen!
Devin


[Hier zum Lernen!](#)



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Unter folgender E-Mail kannst du uns erreichen:
support@mozubi.app

Personal Interest Mail Weeks 1-2 (Subject Line: Schon gewusst? 🎓)



Schon gewusst?

Mit dem Bestehen der Sachkundeprüfung §34a GewO legst du den wichtigsten Baustein, um im Bewachungsgewerbe tätig zu sein!

Seit 2016 müssen Gewerbetreibende, also auch Geschäftsführer, die Sachkundeprüfung ablegen!

Hallo *IFNAMEI*,

ich bin Devin! Ich werde dich die kommenden Tage durch deine Vorbereitung auf die Sachkundeprüfung begleiten.

Wusstest du, dass die Sachkundeprüfung §34a GewO der erste Schritt für dich ist, um im Bewachungsgewerbe erfolgreich zu sein?

Mach weiter so! Du schaffst das!

Viel Erfolg beim Lernen!
Devin

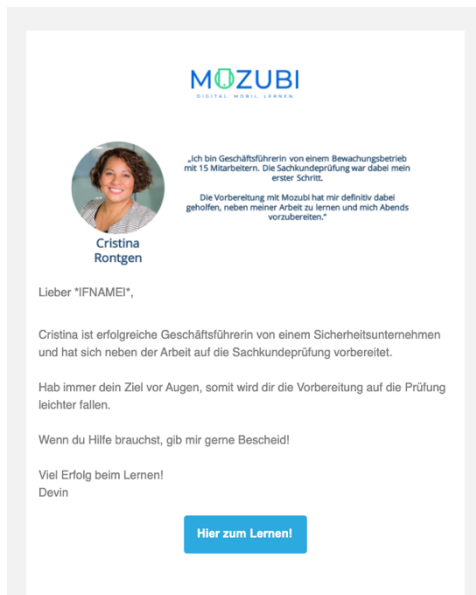
[Hier zum Lernen!](#)



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Unter folgender E-Mail kannst du uns erreichen:
support@mozubi.app

Social Proof Mail Weeks 1-2 (*Subject Line: Was andere zur Vorbereitung mit Mozubi sagen?* 🗣️)



The email template features the MOZUBI logo at the top center. Below it is a circular profile picture of Cristina Rontgen. To the right of the photo is a testimonial in German. The main body of the email is addressed to 'Lieber [FNAMER]', followed by a paragraph about Cristina's success, a motivational sentence, an offer of help, and a closing. A blue button labeled 'Hier zum Lernen!' is positioned at the bottom of the main content area.

MOZUBI
DIGITAL MOBIL LERNEN


Cristina Rontgen

„Ich bin Geschäftsführerin von einem Bewachungsbetrieb mit 15 Mitarbeitern. Die Sachkundeprüfung war dabei mein erster Schritt.
Die Vorbereitung mit Mozubi hat mir definitiv dabei geholfen, neben meiner Arbeit zu lernen und mich Abends vorzubereiten.“

Lieber "FNAMER",

Cristina ist erfolgreiche Geschäftsführerin von einem Sicherheitsunternehmen und hat sich neben der Arbeit auf die Sachkundeprüfung vorbereitet.

Hab immer dein Ziel vor Augen, somit wird dir die Vorbereitung auf die Prüfung leichter fallen.

Wenn du Hilfe brauchst, gib mir gerne Bescheid!

Viel Erfolg beim Lernen!
Devin

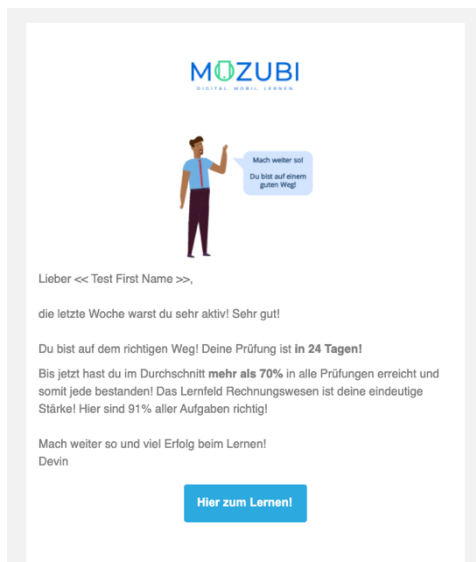
[Hier zum Lernen!](#)



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Unter folgender E-Mail kannst du uns erreichen:
support@mozubi.app

Feedback Positive Mail Weeks 3-4 (*Subject Line: Deine Stärke: Personalwesen* 🎓)



The email template features the MOZUBI logo at the top center. Below it is an illustration of a man in a blue shirt and dark pants, with a speech bubble containing a motivational message. The main body of the email is addressed to 'Lieber << Test First Name >>', followed by a congratulatory message, a specific achievement, and a closing. A blue button labeled 'Hier zum Lernen!' is positioned at the bottom of the main content area.

MOZUBI
DIGITAL MOBIL LERNEN


Mach weiter so!
Du bist auf einem
guten Weg!

Lieber << Test First Name >>>,

die letzte Woche warst du sehr aktiv! Sehr gut!

Du bist auf dem richtigen Weg! Deine Prüfung ist in **24 Tagen!**

Bis jetzt hast du im Durchschnitt **mehr als 70%** in alle Prüfungen erreicht und somit jede bestanden! Das Lernfeld Rechnungswesen ist deine eindeutige Stärke! Hier sind 91% aller Aufgaben richtig!

Mach weiter so und viel Erfolg beim Lernen!
Devin

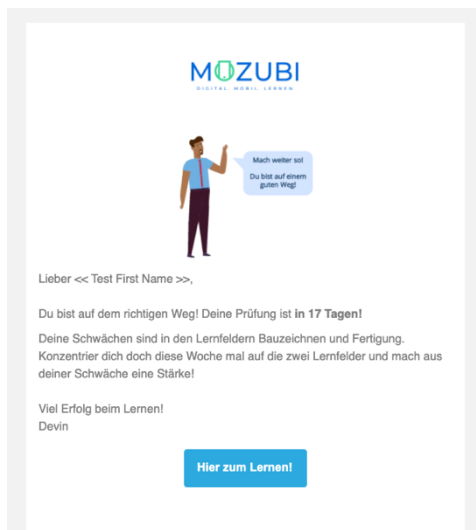
[Hier zum Lernen!](#)



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Unter folgender E-Mail kannst du uns erreichen:
support@mozubi.app

Feedback Negative Mail Weeks 3-4 (Subject Line: Deine Schwäche: Fertigung 🎓)



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Unter folgender E-Mail kannst du uns erreichen:
support@mozubi.app

Appendix 2: Data Chart for Assumption Validation

User-number	Login days	Read articles	Quizzes done	Simulated exams	Average Engagement Rate	Satisfaction Scale
11	1	1	11	0	19	3
27	3	16	3	0	45	4
10	2	8	36	0	74	4
12	4	0	5	0	8	5
7	2	36	124	3	606	5
17	6	0	23	0	35	6
35	5	50	17	0	151	6
36	3	0	22	3	363	6
41	1	23	3	0	62	6
47	1	0	0	3	330	6
5	9	194	243	1	960	7
14	3	71	235	1	640	7
18	3	6	43	0	80	7
20	6	36	95	0	233	7
48	4	62	42	2	438	7
49	3	31	0	0	78	7
50	3	0	0	1	110	7
1	9	192	23	2	735	8
13	1	1	10	0	18	8
23	1	30	36	1	239	8
34	9	57	52	0	221	8
43	9	33	323	0	567	8
2	28	198	614	1	1526	9
9	6	158	395	0	988	9
15	5	196	134	0	691	9
26	1	3	24	0	44	9
28	8	196	170	3	1075	9

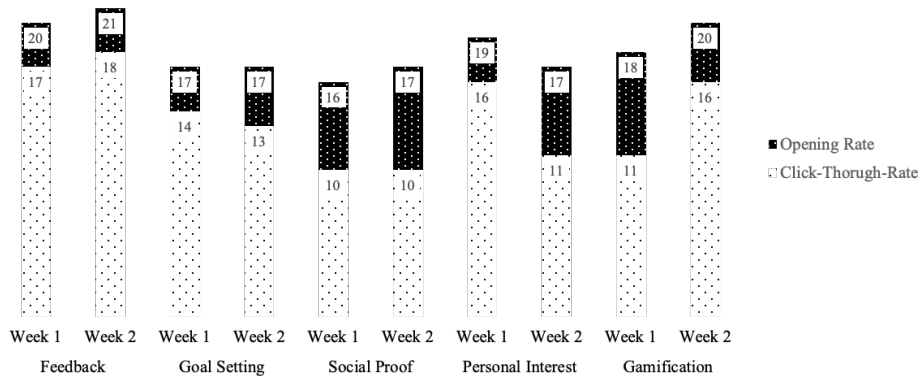
30	3	64	152	2	608	9
31	16	198	674	9	2496	9
33	23	86	1819	0	2944	9
44	11	76	512	7	1728	9
45	19	198	723	8	2460	9
3	7	198	832	8	2623	10
4	5	198	852	6	2433	10
6	16	196	699	5	2089	10
8	15	196	146	6	1369	10
16	14	89	695	2	1485	10
19	13	86	297	14	2201	10
21	9	196	511	7	2027	10
22	7	83	263	8	1482	10
24	10	32	422	8	1593	10
25	24	198	687	16	3286	10
29	8	196	313	2	1180	10
32	15	198	1162	9	3228	10
37	18	198	224	12	2151	10
38	12	198	843	2	1980	10
39	29	198	1190	23	4810	10
40	23	198	903	9	2840	10
42	7	83	272	2	836	10
46	15	198	234	17	2716	10

Appendix 3: MRA with two variables

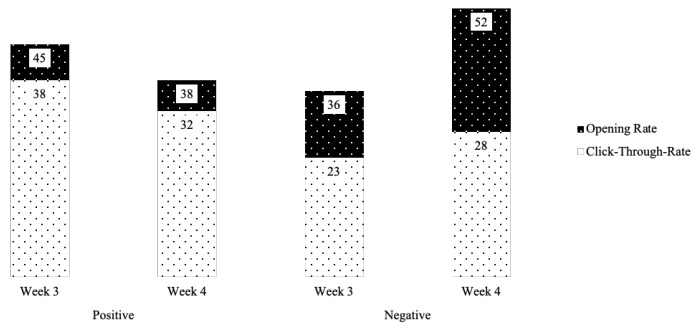
Dependent Variable	Satisfaction Scale	R²	0.502
Model	OLS	Adj. R²	0.480
Method	Least Squares	F-Statistics	23.65
No. Observations	50	Df Residuals	47
Covariance Type	nonrobust	Df Model	2

	coefficient	standard error	t	P> t	[0.025	0.975]
constant	6.7236	0.314	21.466	0.000	6.093	7.354
AER	0.0012	0.000	3.719	0.001	0.001	0.002
Login Days	0.0071	0.048	0.148	0.883	-0.089	0.103

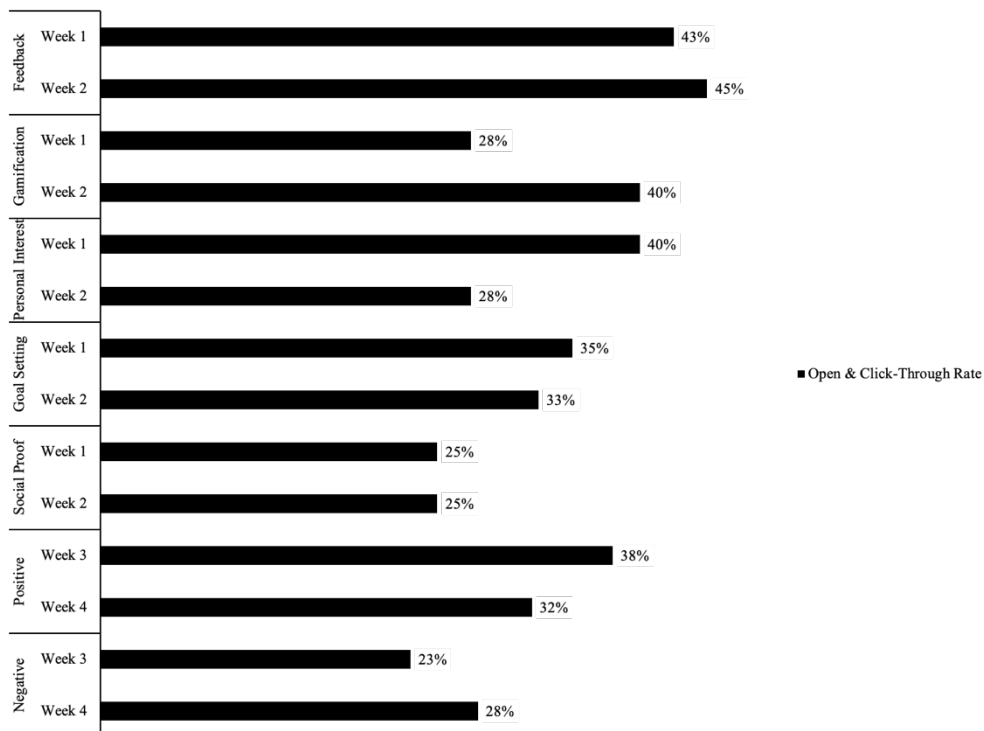
Appendix 4: Week 1 & 2 – OR and CTR by Strategies (absolute numbers)



Appendix 5: Week 3 & 4 – OR and CTR by Writing Style (absolute numbers)



Appendix 6: Week 1 - 4 – Accumulated OR & CTR by Strategy and Writing Style (relative numbers)



Appendix 7: Week 1 - 4 – Average Activity of Users by Strategy and Writing Style (absolute numbers)

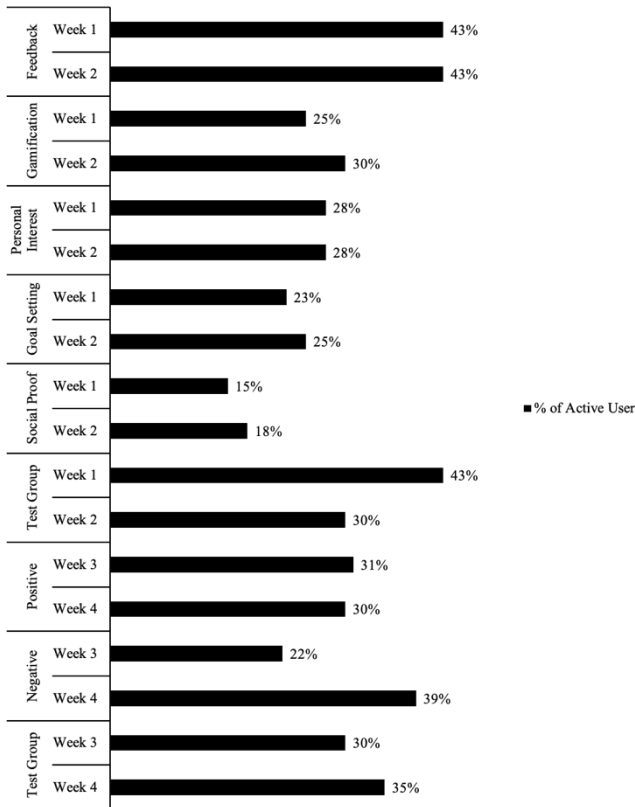
Week	User Active if CTR	User Active if OR only	User Frequency if CTR	User Frequency if OR only
Week 1				
Feedback	15	2	2,47	1,50
Goal Setting	8	1	2,13	1,00
Social Proof	5	1	1,40	1,00
Personal Interest	10	1	1,80	1,00
Gamification	8	2	2,00	1,50
Test Group		17		1,82
Week 2				
Feedback	16	1	2,69	1,00
Goal Setting	8	2	2,00	1,00
Social Proof	6	1	2,83	1,00
Personal Interest	11	0	2,55	0,00

Gamification	12		0	3,08	0,00
Test Group		12			1,83

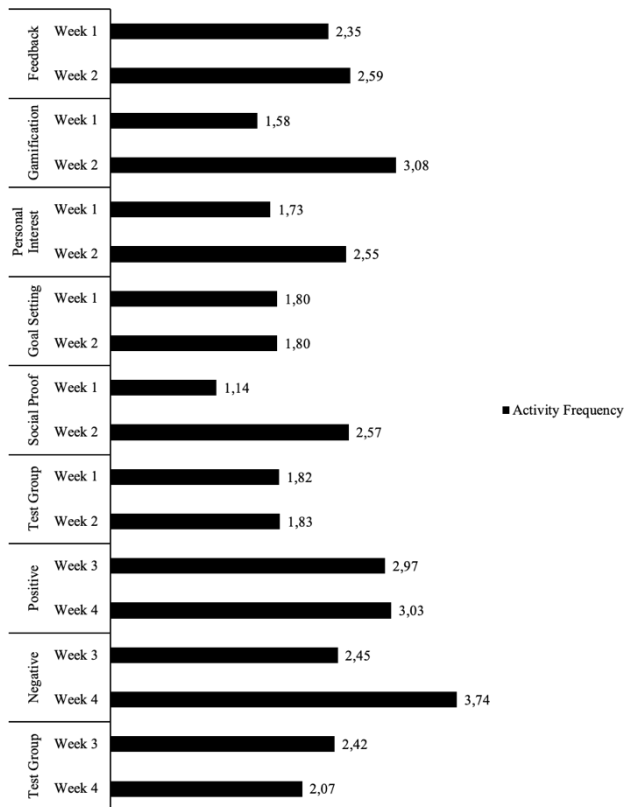
Week 3	User Active if CTR	User Active if OR only	User Frequency if CTR	User Frequency if OR only
Positive	28	3	3,04	2,33
Negative	19	3	2,53	2,00
Test Group		12		2,42

Week 4	User Active if CTR	User Active if OR only	User Frequency if CTR	User Frequency if OR only
Positive	28	2	2,89	5,00
Negative	28	11	3,71	3,82
Test Group		14		2,07

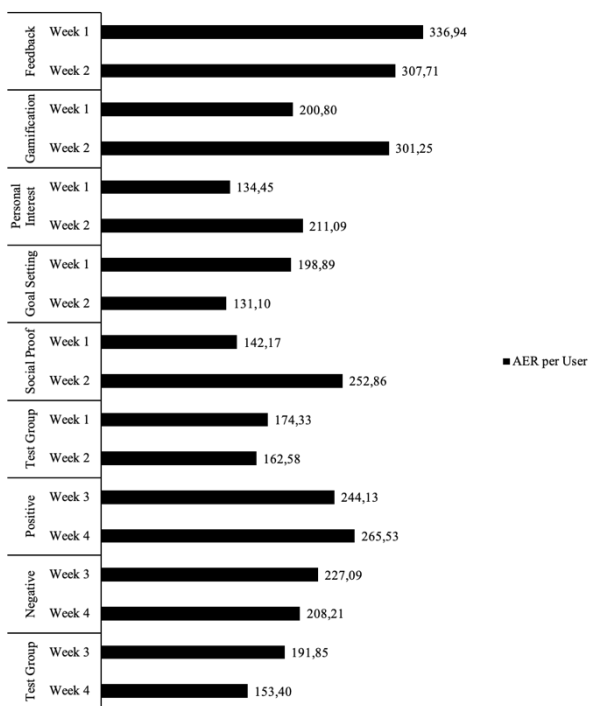
Appendix 8: Week 1 - 4 – Average % of Active Users by Strategy and Writing Style (relative numbers)



Appendix 9: Week 1 - 4 – Average Frequency of Active Users by Strategy and Writing Style (absolute numbers)



Appendix 10: Week 1 - 4 – AER per Users by Strategy and Writing Style (absolute numbers)



V. Table of Interviews

Interview	Company	Interviewee
Interview A)	Good Plan Studio (Educational Psychologist)	Stephanie Sedlmayer- Weßling
Interview B)	Educational Psychologist (Self-employed)	Kerstin (Anonym)
Interview C)	Delasocial (Marketing Specialist)	Anonym